McGRAW-HILL INTERNATIONAL

Management Digest

TECHNICAL • INDUSTRIAL • COMMERCIAL

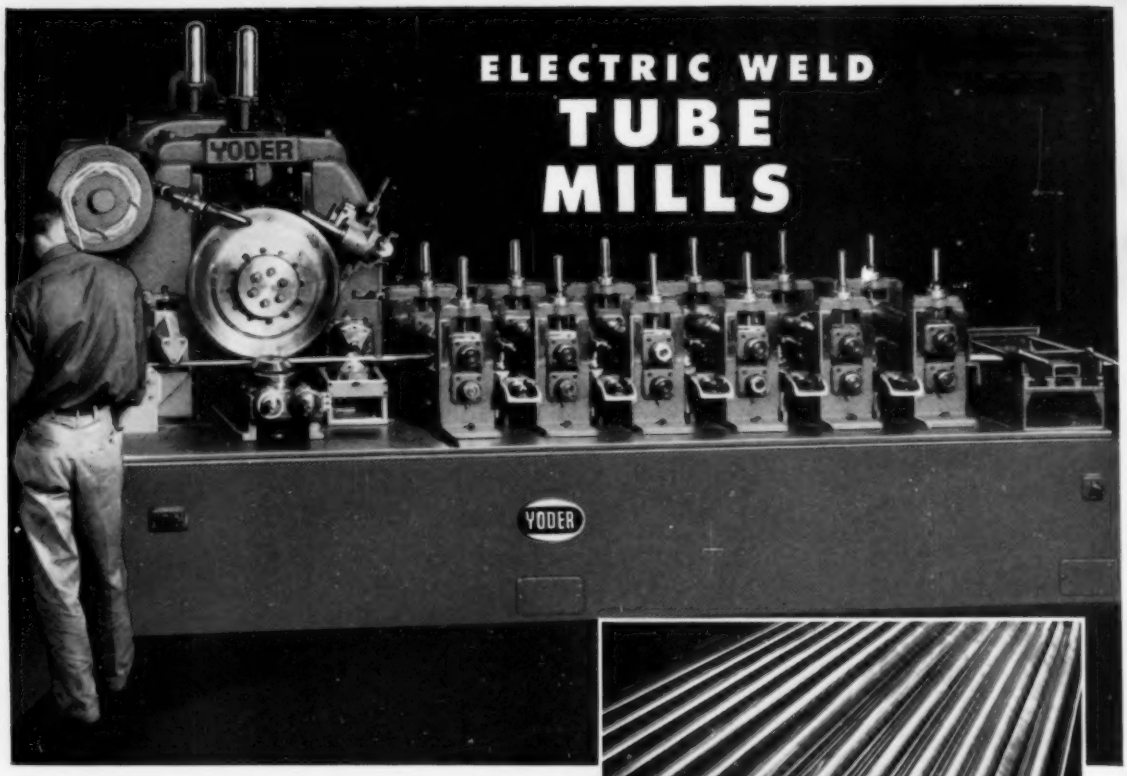
MARCH 1956 OVERSEAS EDITION

how is business?

...expanding
...inflationary
...competitive

...page 7

What makes a manager?—p13
How important are brand names?—p34
Now: an atomic camera—p42



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The Versatile HD-6G

HD-6G

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57 hp diesel engine
4 forward speeds
to 8.9 km (5.5mi) ph
2 reverse speeds
to 6.6 km (4.1mi) ph

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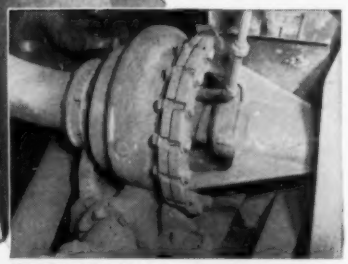

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Your Worthwhile Reading for March 1956:

WORLD BUSINESS

March 1956: World Boom Rolls On..... 7
U.S. Consumers Buy More Abroad..... 9
Europe Buys More Made-In-U.S.A. Goods..... 9
Home Demonstrates Electric Living..... 10
West Europe's Business Fears Middle East Strife..... 12

MANAGEMENT METHODS

Executive Training: What Is Its True Value?..... 13
Finance Lessons: Good Results for Managers..... 14
Try Reports to Workers..... 15
How Handicapped Can Earn Their Way..... 15
Boost Quality—Retain Volume..... 16
Automation: No Threat to Office Jobs..... 17
Let a Camera Do the Job..... 18

NEW PRODUCTION TECHNIQUES

Process Puts Tube Inside Metal Strip..... 19
Photocells Can Make Hard Jobs Easy..... 20
Do-It-Yourself Computer..... 21
Atom Smasher: New Processing Tool..... 22

FINANCE

Consumer Credit Spreads Worldwide..... 32
Inflation Threat in U. S. No. Longer Top Problem..... 33
Financial Digest..... 33

MARKETING

Is "Brand Loyalty" Really Worth What It Costs..... 34
Sell More the "Dynamic" Way..... 35

ENGINEERING

How to Redesign for Die Casting..... 36

TRANSPORTATION

When Chicago Becomes a Seaport..... 38
Helicopter Works As Uranium Hunter..... 39

CONSTRUCTION

Latin America: Billions for Building..... 40

PLUS . . .

World Trends..... 5
You..... 37
Product Digest..... 42
Management Reading..... 51

Crew of mobile bank consists of typist, secretary, cashier, manager, loan officer and driver (not shown).

Bank on wheels gets big business from small business

Mexico City's Banco del Pequeño Comercio (Bank for Small Business) was founded to serve the 75,000 public vendors and other small businesses of the city. These customers are reluctant to leave their locations to come downtown to bank. Yet, because of the small sums involved, the bank could not afford to set up a network of branches.

The bank's general manager, Sr. Diego López Rosado, found an ingenious solution: mobile banking units that would stop on regular schedules at designated points throughout the city.

When planning the units, management asked the advice of the Burroughs man. He suggested a plan using Burroughs tellers' machines and adding machines, with the general accounting being done at the main office on a Burroughs Sensimatic accounting machine.

Result. From the start, the system has provided fast, efficient service for the patrons. Business is expanding so rapidly that plans are being made to have "Banks On Wheels" throughout Mexico.

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"Our Burroughs machines have paid for themselves," says Sr. López Rosado. Interior view shows compact, efficient arrangement inside specially built vehicle.

Call in your local Burroughs man

WORLD TRENDS

RUSSIA . . .

Moscow hopes to push a lot closer to the level of U. S. industrial power by 1960. The Sixth Five Year Plan tells a story of bold ambition to expand heavy industry. Tremendous increases in output of steel, electricity, capital equipment are demanded of the Russian worker. . . . **The worker, though, is given less, not more.** Consumer goods get the short end of the budget.

The picture in steel gives an idea of the emphasis on capital goods. The steel target for 1960 is 75-million net tons a year, compared with 50-million in 1955. The 1960 target is almost as much as all Western Europe, including Britain, produces today . . . . Output of electric power and machine tools is to be nearly doubled. . . . **Automation, and technical training, are high priority items.** Western visitors report that Russia has the needed knowledge, the needed equipment, to do the job.

But Western experts wonder about the Soviet worker. The Kremlin's plan calls for a 50% increase in output per manhour. This is vital. It also calls for a sharp decrease in the consumer goods budget; consumer goods industries were reduced from 36.6-billion rubles in 1954, to 27.9-billion in 1955, **and now to only 26-billion in 1956.** . . . Will the industrial worker and the farmer produce what is expected—in return for a lower standard of living —even with the aid of more and better tools?

LATIN AMERICA . . .

The atomic age approaches Latin America. But it offers no easy solution to a dire shortage of industrial energy. This basic problem—a real threat to the 20 republics—is emphasized by the plans for three small atomic power plants to be constructed in three Latin nations within the next two years or so. Each plant will have a 10,000 kilowatt capacity. **Yet 30,000 kilowatts is only about 1% of new capacity that will be needed in the next 10 years.**

Investment is the key to Latin America's energy problem. If living standards are to increase just 2½% a year for 10 years, use of petroleum and natural gas will have to double. So will output of hydro-electric, diesel electric, and steam power. $800-million to $1-billion a year will be needed; **over half of it for equipment from Europe, North America, and Japan.**

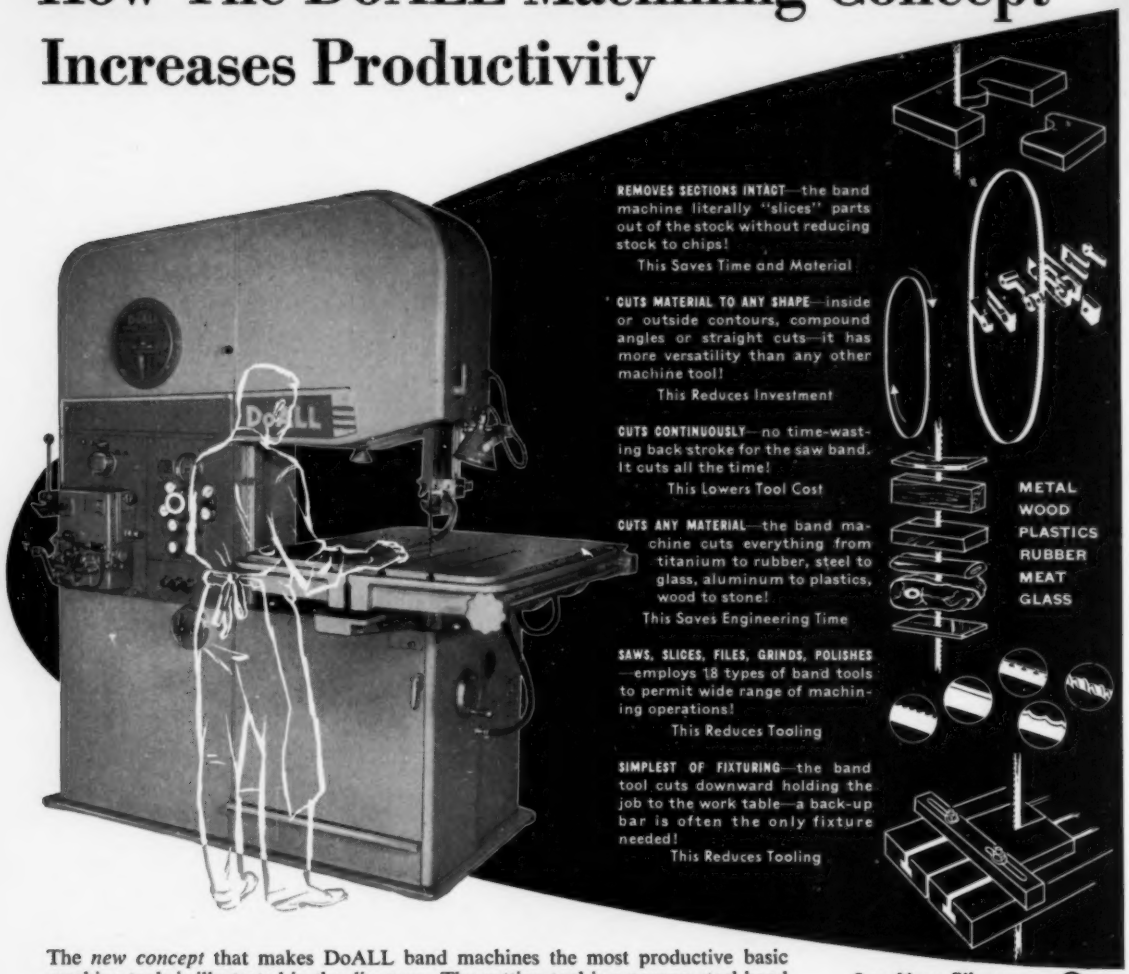
Atomic power? Its big advantage: cheap transport of light-weight fuel in an area with poorly developed land transportation. **Its big disadvantage:** investment cost per kilowatt would be at least double the sum needed to produce energy by conventional methods.

UNITED STATES . . .

It is an election year, and that means a noiser-than-usual battle over foreign economic policy. Some likely developments:

- **Long-term foreign aid**—a program through which Washington could promise continuing assistance to specific projects over the years. Eisenhower will push this plan, and **will probably get approval,** at least in compromise form.
- **Organization for Trade Cooperation (OTC)** to implement GATT agreements: OTC is in trouble, and U. S. membership **may be blocked in the Senate.** Outcome will depend on how hard Eisenhower fights for OTC.
- **Customs simplification** is low priority legislation, and **could be postponed** another year. Demands for an **import quota system,** in place of tariffs, is protectionist tactic to defeat OTC. Don't worry about it now.

How The DoALL Machining Concept Increases Productivity


DoALL
REMOVES SECTIONS INTACT—the band machine literally "slices" parts out of the stock without reducing stock to chips!
This Saves Time and Material
CUTS MATERIAL TO ANY SHAPE—inside or outside contours, compound angles or straight cuts—it has more versatility than any other machine tool!
This Reduces Investment
CUTS CONTINUOUSLY—no time-wasting back stroke for the saw band. It cuts all the time!
This Lowers Tool Cost
CUTS ANY MATERIAL—the band machine cuts everything from titanium to rubber, steel to glass, aluminum to plastics, wood to stone!
This Saves Engineering Time
SAWS, SLICES, FILES, GRINDS, POLISHES—employs 18 types of band tools to permit wide range of machining operations!
This Reduces Tooling
SIMPLEST OF FIXTURING—the band tool cuts downward holding the job to the work table—a back-up bar is often the only fixture needed!
This Reduces Tooling
METAL
WOOD
PLASTICS
RUBBER
MEAT
GLASS

The *new concept* that makes DoALL band machines the most productive basic machine tools is illustrated in the diagrams. The cutting tool is a narrow steel band with hundreds of tool points—suspended between widely spaced tool holders. Hence the scope of its cutting action is not restricted. It is the world's fastest method of machining from solid steel. Everyday machining operations like slotting, notching, trimming, angular contour cutting, etc., as well as making special parts, can be routed to the DoALL Band Machine to gain enormous savings over former machining methods.

In addition, there is little or no waste of material or consumption of engineering time for fixturing and tooling with special machines.

And now this profitable machining method has a spectacular new cutting tool in the DoALL Demon *High-Speed Steel* Saw Band. There is no machining rival for its performance on DoALL Contour-matics. Cutting rates are up to ten times faster with up to thirty times longer cutting life.

We sincerely urge you to get the facts by calling your local DoALL Store. They will arrange a personal inspection demonstration of this machining concept in your plant. No obligation of course . . . it is our privilege to serve your machining needs.

See New Films—
revealing this new concept for cost reduction in machining. "Production Band Machining" 30 minutes. "Production Tooling" 10 minutes.

Free-Educational Poster

Fundamentals of Economics in this age of machines and power are described in this Educational Wall Poster. Write for free copy.

Demon and Contour-matic are registered trade marks of The DoALL Company.

THE DoALL COMPANY Des Plaines, Illinois, U.S.A.
Makers of Band Machines and Blades . . . they go together

DoALL

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McGRAW-HILL INTERNATIONAL

Management Digest

MARCH 1956
VOL. 11—NO. 3

● Britain and Europe

Confident, bustling, inflationary . . . "How long can the boom last?" Fast changing consumer tastes and demands . . . rapid flowering of atomic projects . . . more automation . . . more liberal treatment of dollar imports—but no formal convertibility . . . severe shortages of labor, steel, and—above all—energy.

● Latin America

A slight drop in U. S. purchases . . . worry over huge coffee stocks . . . more U. S. loans . . . U. S.-European competition . . . well-managed prosperity in Mexico . . . more boom in Venezuela . . . mining investment in Peru . . . galloping inflation—a new broom—in Brazil . . . strains in Argentina.

● Asia

A restless market for the West's exports . . . all eyes on underdeveloped Asia as Soviets press their suit . . . how much will West help? . . . India begins Five Year Plan . . . Japan on crest of sudden export boom—but working on a thin margin.

March 1956: World Boom Rolls On

Digested from BUSINESS WEEK, Dec 31, p33

Each year world business takes on a more inter-related look. 1956 is promising no let up in this trend. Here are some of the things you will have to watch as you do your planning this year.

Britain and Europe

British businessmen have swept into 1956 on the crest of prosperity. The past year has seen the greatest outburst of management confidence since before World War I, swamping construction and machinery industries under a tidal wave of orders.

The question now is whether Britain's economy has reached a permanent high level of activity, or is merely passing through an insecure boom.

British businessmen seem unworried by the financial problems that concern bankers and Treasury officials—such as inflation, and the drain on gold reserves. To be sure, there is the threat of pricing British goods out of world markets, but many businessmen seem to rely on similar cost increases in competitor countries to balance things.

These businessmen concentrate on the boom at home. They point to the vast changes in Britain: the new mass market for appliances, television, cars; the higher spending power of workers and clerks, raising the demand for services; a labor shortage which stimulates the development of new equipment and automation.

Western Europe is following Britain's pattern. But the strains felt on the Continent have been less severe.

European economists and business people look for more liberalization of curbs against dollar imports, more de facto convertibility of currencies, more energetic efforts to attract U. S. capital. They think the British may have their inflationary problem under control. They do not expect severe price increases in Britain or Europe.

They worry most about new capital needs—in energy, in steel. They want atomic power and are willing to explore cooperative methods to get it.

West Germans expect their boom to slow down a bit. Plant expansion will level off. Shortages of labor, materials, and capacity are straining the economy. Consumers and unionized labor want a bigger share of the output. Thus businessmen may see their profits shrink.

German exports are bound to expand at a slower rate this year. And imports will rise. Observers in Bonn expect increased dollar imports.

The French are optimistic, but guardedly so. The economy tends to be over-insulated from outside pressures. After three years of almost complete price stability, this year promises at least moderate inflation—thanks to a growing budget deficit and higher wages. Without devaluation, France is unlikely to become a stronger exporter.

Italy, striving to build up the southern half of its country, will strain its resources and may have

to slow down. The Low Countries will prosper, though they too face rising wage levels and shortages. The Swiss will make money.

Latin America

These factors stand out: New reform governments in Argentina and Brazil; the drive to build and industrialize everywhere; increased mining activity; more U. S. lending; inflation; and—inevitably—coffee.

Latin Americans will do their best to prop coffee prices, but they will not succeed completely. And as their coffee earnings drop, their imports of foreign goods will drop. Larger earnings from mineral exports will help. But over-all, 1956 is apt to see a slight decline in shipments to the 20 Latin American republics.

Mexico has just marched to the biggest economic year in its history—despite the 1954 devaluation of the peso. But living costs are edging up. And Mexicans are worrying about cotton, their largest export item, and the huge U. S. surpluses.

Brazil looks to President Kubitschek to lift the country out of its business doldrums. How to do that and avoid inflation is his dilemma. Brazil will be able to buy few nonessentials from abroad.

Argentina is another uncertain spot. Many Argentines believe that Provisional President Aramburu will not last in the face of pressures built up by 12 years of Peronist economics. Few observers forecast any appreciable increase in either foreign trade or investment in 1956.

Venezuela is riding on a high boom. Competition there between U. S. and European businessmen is increasing. New oil concessions are likely.

Asia

The demand is heavy for industrial goods—that fact seems to dominate. Russians, Czechs, Poles, and Hungarians claim they are ready to supply Asia with what it wants. This year may see East-West economic competition in Asia come to a head.

Japanese businessmen, struggling to reestablish themselves in South Asian markets are not doing too well, thus far. They are worried about competition from Eastern Europe and even Communist China. Moreover, they do not expect to increase their own trade with Communist China.

But Japanese businessmen are on the crest of an export wave. Trade with sterling countries has been excellent. With the U. S., it has hit an all-time high. Though here, too, the future looks cloudy. This year may see fewer exports to the U. S. because of trade restrictions. And on the import side, Japanese purchases of U. S. cotton may drop. Foreign investment will not be encouraged.

India, in pursuit of its second five-year plan, will strain its resources to the limit. How to find the capital to meet crucial development needs is India's vital problem.

United States

This will be an active year for U. S. business abroad. Non-military exports are expected to top $14-billion. Much of these sales will be in raw materials such as coal and steel, with consumer goods and capital goods facing sharper competition in world markets. U. S. imports may hit $11.8-billion. That total would include a moderate increase in imported manufacturer items—though Japanese imports are apt to be restricted. The biggest import rise will be in industrial raw materials.

Look for an increase in the outward flow of U. S. private capital, rising from 1955's low of about $900-million. More public and private money seems outward bound—more medium- and short-term credit, more overseas ventures by Wall Street; more long-term development projects—such as Peruvian copper, Colombian oil, Canadian pipelines—demanding capital.

But some questions are beginning to appear. Industrial nations ask "How long can the boom last?" Underdeveloped nations want to know "Where can we get help to speed our growth?" The U. S. holds the key to the answers.

A severe recession in the U. S. would affect free world confidence. But that is not likely. A more immediate concern is the trend of U. S. foreign-economic policy. There is a new protectionist drive for stiff quotas, rather than tariffs, to bar foreign goods. And Congressional action on the Organization for Trade Cooperation (OTC will adopt rules and police world commerce) will do much to shape future U. S. foreign economic policy.

The world worries about the pattern of mounting U. S. farm surpluses. They will be the focus of trouble politically, in the U. S. and abroad. And while they may have only marginal economic effect on commerce during 1956, surpluses may become a drag on 1957 business.

On the other hand, the U. S. seems poised to expand its development aid, as well as military assistance, overseas. During 1955, the Export-Import Bank sharply increased lending. This year a new, long-term development assistance program may just begin to take shape. That could increase the flow of U. S. equipment, technology, and ideas abroad in years to come.

Canada

After a year that started slow and ended breaking records in output and spending, Canadians worry about shortages and rising prices. The Bank of Canada, with the highest discount rate in its 20-year history, is keeping careful check on inflation.

Both consumers and corporations seem in a buying mood for 1956; capital spending should pass a record $6-billion. Large projects—pipelines, and major outlays for the St. Lawrence Seaway—are in prospect. The limiting factor seems now to be shortages of materials—such as steel. On its farms, however, surpluses plague Canada. Little relief for the farmer is in sight.

As far as international trade is concerned, many Canadians feel that Canada should buy more from Britain and Europe, less from the U. S. But little in this area is likely to be accomplished. Some Canadians want higher tariffs. A very few will get them. As a trading nation, Canada can not afford to raise barriers indiscriminately.

U. S. Consumers Buy More Abroad

Digested from AMERICAN LETTER, Jan 7

Sales of imported items coninue to move briskly in the U. S. Preliminary reports from retail stores indicate that previous records were broken in holiday sales of many imports. And demand should stay high through the first quarter of 1956. All signs point toward a continuing profitable U. S. market for your consumer products.

A greater variety of imports is noticeable on store counters. Not only has there been an increase in the volume of goods from France, Italy, Germany, Japan and the United Kingdom, but there also are many more attractive products in the market from other countries this season. Around the world, this is how different countries fared in the U. S.

• **United Kingdom**—Present estimates by retailers indicate that the value of Christmas sales of British goods was somewhat better than a year ago. But percentage gains do not compare with those registered by Germany, Italy and Japan. British goods are marketed in the U. S. on a quality rather than a novelty basis. Britain relies on tradition and reputation in the U. S. market. But the more aggressive competing countries are cutting into her business.

• **Germany**—A great variety of goods was offered in many U. S. stores. Early reports foretell booming business. Toys were outstanding sellers, as were Solingen steel products, clocks, household articles and novelties.

• **Italy**—Leather bags experienced peak sales. Silk and wool fabrics also moved rapidly. Christmas gift items which sold particularly well were straw baskets, velveteen apparel goods, leather gloves, and alabaster products.

• **Japan**—Textiles, women's good-quality sweaters, caps, shirts, slippers and gloves practically disappeared from the counters.

• **France**—Relatively high-priced leather handbags, gloves and wallets sold well during the Christmas season. Perfumes, wines, cutlery, glassware, food specialities, and earthenware were excellent sellers.

Holiday retail sales in the U. S. reached new heights. A survey of 59 retail stores in 24 large cities throughout the country indicates that Christmas shopping records were broken in most areas. Women's apparel and fashion accessories scored large gains of 1954. Retailers in many cities also noticed a consumer tendency toward more expensive items. Here is a commodity survey:

• **Jewelry**—Merchants in most U. S. cities report "a resounding comeback" after a long slump. Inventories in many items are low now. In watches, a marked improvement took place over December, 1954 sales.

• **Furs**—Dealers throughout the country are enthusiastic about holiday fur business this year. Imported skins moved briskly, particularly Scandinavian mink, and Persian lamb from Southwest Africa and Iran.

• **Sweaters**—Imported sweaters made their greatest gains during December. In addition to heavy buying of traditional British varieties, consumers purchased huge numbers of sweaters from Austria, Ireland, Italy, and especially Japan.

• **Toys**—Despite powerful Japanese competition, the German toy industry topped previous production and sales peaks this year. Germany's best sellers in the U. S. were mechanical toys in the medium- and high-priced ranges.

Europe Buys More Made-In-U.S.A. Goods

Peter Kaufman, Swiss department store buyer (pointing in picture above) has been on a hetic, whirlwind tour of New York City's wholesalers and manufacturers of consumers' goods. His job was to find, and buy, items that would appeal to women shoppers in Switzerland.

Kaufman's trip was a sign of an important trend in Western Europe: a growing interest in made-in-U.S.A. goods. It is a reflection, in part, of Europe's prosperity—rising incomes and a mass market.

Just as European goods have come to the U. S. in an increasing flow (see above), U. S. consumer goods are finding more favor in Europe. Basic reasons for this appear to be: (1) U.S. goods show brighter colors and more radical designs, (2) many U. S. gadgets are not yet made in Europe, (3) mass production methods in the U. S. often result in a product that European manufacturers can not match for price—Digested from BUSINESS WEEK, Dec 24, p50

Located in Indianapolis, this prime example of living the all-electric way serves both as resident and business headquarters for its owner, O. C. Winters. Mr. Winters is an architect and builder of custom homes and uses the house as a showcase.

Home Demonstrates Electric Living

Digested from ELECTRICAL WORLD, Jan 16, p16

GOOD LIGHTING spares eye-strain, and adds glamor. Home has 400 feet of slim-line tubing.

KITCHEN VIEW I: Range counter units, freezer, and refrigerator.

KITCHEN VIEW II: Built-in oven, rotisserie, and electric sink units.

Its Purpose: To Sell the Idea of Electric Power for Better Living

These Are Its Features

Two 5-horsepower heat pumps (Insulation: 8 inches in ceiling, 12 inches around air ducts.)

Electric kitchen including built-in oven, range surface units and rotisserie.

Cove lighting, valance lighting, spot lighting, all designed to give high-level, glare-free illumination; yet add glamor and decoration.

A 120-gallon electric water heater.

Electric lamp in bathroom cabinet to dry towels and lingerie.

Two built-in television sets.

Wired television and intercom system for seeing and communicating with different points in house, and front and rear entrances.

Outdoor pool with waterfall. Electric pumps recirculate water.

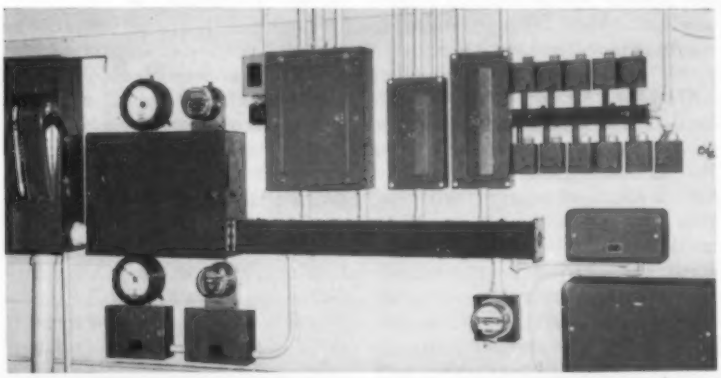
Garage doors that open and close by radio controls built into the family's two automobiles.

Low-voltage, remote-control wiring provided by 13,000 feet of cable.

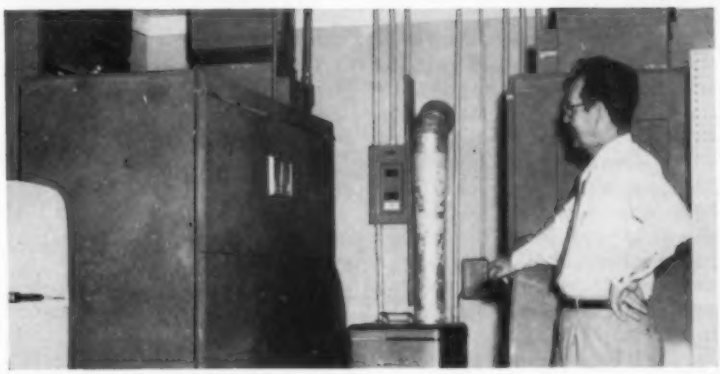
2,000 feet of 54-pair cable on inter-com and high-fidelity phonograph systems.

2,000 feet of other cables including heating cable embedded in floors and in sidewalks and driveway.

All this adds up to a total connected load of 155.8 kilowatts in one single dwelling. Usage: Lighting, cooking—18,000 kilowatt-hours, water heating—6,000 kilowatt-hours, air conditioning—3,200 kilowatt-hours, heating—36,168 kilowatt-hours. This is an estimated total of 60,168 kilowatt-hours per year.



SERVICE is provided by 600-ampere line. Extra meters provide data on heat pumps, other equipment.



TWO 5-TON HEAT PUMPS occupy utility-room-garage. Heating cable in floors furnish supplemental heat.

West Europe's Business Fears Middle East Strife

Digested from BUSINESS WEEK, Jan 21, p112

The explosive forces of nationalism are threatening to produce a power vacuum in the Middle East—a region that contains half the free world's oil reserves, has historically been the strategic bridge between Europe and Asia, and is now a potential Communist gateway to Africa.

British power, which long dominated the region, has declined to the point where Western control could be broken. Already the Communists are moving into position, anxious to fill the vacuum.

More is at stake in the Middle East than Western access, via Suez, to the shortest sea routes to the Far East, than strategic airbases in the area, than Western oil revenues. If the region ever came under Soviet control, or became submerged in chaos, Western Europe would suffer a severe economic blow. For Britain, it would unquestionably be an economic catastrophe.

Without Middle Eastern oil, British and Continental industry would slow down drastically. The British and West Germans already are so short of energy fuels that they must spend close to $500-million a year on coal imports. With Middle East sources of oil gone, Britain's overseas payments would swing well over $1-billion into the deficit column.

This undoubtedly explains why Moscow has moved into the Middle East. It also explains why U. S. and British experts are working around the clock to stop the continuing decline of Western influence.

Two events toward the close of 1955 prove how serious things have become for the Western position: At the end of September Premier Nasser of Egypt exploded the news that he had made an arms deal with the Communists. In December anti-Western riots in Jordan forced the resignation of a pro-British government that had planned to take Jordan into the Middle East Treaty Organization —the "northern tier" alliance of Turkey, Iraq, Iran, Pakistan, and Britain.

The situation has now become so difficult for the West that key decisions made by Eisenhower and Eden will be kept secret. Their decisions involve plans for behind-the-scenes use of diplomatic, military, and economic pressures —decisions that would lose their effect if made public.

But it's not hard to guess that these decisions include the following:

- Reinforcement of British military positions. British controlled bases in Jordan, Iraq, and the Persian Gulf already are being strengthened. So are British reserves on Cyprus.
- Joint U. S.-British pressure to get an Arab-Israel settlement.
- More economic aid for the Arab countries, including financial help for Egypt's Aswan High Dam. However, a big regional development program, such as London talks of, is out of the question for now.

Such a program adds up to a holding operation—a stalemate—rather than a bold new initiative. Whether it will be enough remains to be seen. The British undoubtedly want a more dramatic show of strength, both military and economic.

There are two landmarks in the postwar decline of British power in the Middle East: (1) the end of British mandate rule in Palestine in 1948 and its replacement by a dynamic Israeli state; and (2) the anti-feudal revolution that overthrew the Egyptian monarchy in 1952.

The emergence of Israel electrified all the Arab states, unified them on at least one thing: their hostility to Israel and their bitterness toward the U. S. and Britain for supporting their enemy.

But the Egyptian revolution, though still far from complete, is having an effect that may prove even more far reaching than the creation of Israel. It is undermining the traditional social and political pattern in the rest of the Middle East.

An awakened middle and professional class is beginning to wonder about the advantage of being ruled by kings, sultans, pashas, sheiks, and kaids. More and more, the feudal rulers must listen to the voice of this class.

It was this class, supported by the Communist Tudeh party, that put Mossadegh in power in Iran, backed his oil expropriation policy, and almost succeeded in overthrowing the Iranian monarchy. In Jordan the same class—with encouragement from Egypt, help from Soviet agents, and financial support from Saudi Arabia—put an end to British hopes of drawing Jordan into the Middle East Treaty Organization.

This new middle class may have different local goals from country to country but it has at least three in common: (1) an ambition to establish national governments that will serve its interests; (2) a burning desire to get rid of Western political controls; (3) a growing resentment of Western control over the region's vast oil resources.

Egypt, a nation poor in oil, can count on U. S. financial help—assuming Premier Nasser decides to (1) let the West, rather than Russia, build the Aswan High Dam; and (2) not take any more Communist arms.

The fact is that Nasser, more than any other Middle East leader, holds the future of the area in his hands. His moves are sure to make a big difference in how British-U. S. policy develops over the next year or two.

Executive Training: What Is Its True Value?

Digested from THE ECONOMIST (London), Dec 17, Special Report

The men above, like many members of top management, are working late, searching for a decision. They are having trouble with the most difficult personnel problem that ever confronts top management—the filling of a vacancy in top management itself.

Their problem, on the surface, is simple: to select a new production manager to fill an unexpected vacancy. But they are unprepared. They can appoint one of several competent department supervisors, and take a chance on his having high-level executive ability. Or they can go outside the company—a step they would prefer to avoid.

Finally they may reach a rather halfhearted decision. And then the question may well be asked: "Should we have given more attention to executive training?" . . . They are not sure. Their case is not unusual.

What makes a manager? Are they born or made? Is executive ability simply a high skill that can be mastered like a course in chemistry? Or is it an art that is born in some men and not in others?

In Britain and elsewhere in Europe there is a growing belief that middle management could be improved by more formal training in administrative method. The middle manager should be trained because he cannot take full charge of his particular department unless he has a grasp of over-all organization and operation. Top managers, most British and Continental businessmen still feel, are not developed by training, at least not by formal university or company programs.

Middle management is the critical sector. It is the training ground for the potential top executive, and is the area in which slow-maturing talent can be recognized and encouraged. If management neglects its own "middle men," which it often does, then the company suffers two losses: first, departmental performance is poor; and second, first-rate "university talent" is frightened off by the prospect of slow advancement and a dull career.

But middle management is fairly new to industry, and thus misunderstood in many cases. In fact, the bulk of effective management training is not for this critical middle area, but rather for the top jobs. This is true partly because of tradition (in Europe) and partly because traditional training for executives was developed long before middle management became important.

Formal training programs in Britain and in most countries of the Continent are confined to a small minority of firms. British firms are apt to adopt formal training only if they are expanding fast and in dire need of executive talent. The trend toward more training in British industry continues, however, along these lines:

- Hit-or-miss talent spotting is

becoming less prevalent. More concerns are conducting regular periodic reviews of talent within the company. These reviews are supervised, not haphazard.

• Companies are finding that they must advertise if they expect to get first-class applicants. Training is a big attraction.

• Big firms are thinking more and more in terms of hiring the best university talent before graduation. Students are often hired part-time.

• Job rotation and "learning by doing" is still the most popular method of training.

• Lecture courses within the company are gaining favor. They cover the firm's organization, operation, policy. Emphasis is also placed on very practical subjects like plant layout, costing, etc.

• The U.S. system of having trainees act as assistant foremen is sometimes practiced.

• Some firms encourage men to join small employers to gain management experience, with the intention or re-employing them later on.

• Some large firms have their own "staff colleges" for advanced training; others have senior executives meet for a week or two under the guidance of outside business-college teachers.

• As a rule, it is not until the firm's resources prove inadequate that outside college courses are considered. Interest, thus far, lies in brief, short-term sessions. Short residential courses to "broaden" managers are becoming more and more popular. They last up to three months.

• Five British universities offer postgraduate courses in business administration: full-time college programs lasting a year. The response of industry, for employed personnel, has up to now been negligible.

• A scheme for management education at technical colleges to be jointly operated by the British Ministry of Education and the British Institute of Management was set up recently. The course is based on five years of part-time study. It is now widely regarded by businessmen as a failure.

Finance Lessons:

Good Results for Managers

- **Here is an up-to-date case study of management training in practical action.**
- **Second-level executives of the company knew surprisingly little about corporation finance.**
- **So top management decided on an intensive in-the-office training routine.**

Digested from BUSINESS WEEK, Jan 7, p66

National Starch Products Co. planned a corporate merger with another concern late in 1954. The merger never took place, but NSP indirectly gained a solid benefit in terms of personnel.

Frank Greenwall, president of NSP, while trying to carry out the merger plan, discovered that his middle-management executives could "make practically no contribution to the financial planning." They simply knew little or nothing about the basic facts of corporate financial life. For example, they posed elementary questions about NSP's ability to carry a $16-million loan that was available at favorable rates. They wondered why NSP should not raise the money by selling preferred stock, instead of borrowing.

An in-plant training program was what his executive team needed, thought Greenwall—maybe more than NSP needed the merger. So last November he started what has developed into a highly effective course in corporation finance and law. Twenty-three NSP executives, mostly department managers, attended nine evening sessions of 2½ hours each.

Formal university courses were bypassed by Greenwall because: (1) A special program in finance and financial law was needed, not a broad coverage of "business." (2) Long-term instruction for a large segment of NSP's management group was not practical.

The company training director organized the course. As teachers, he brought in two men from NSP's regularly retained law firm, and used NSP's own controller and one of its directors who frequently serves as financial consultant. Together they presented a fast-paced course for the nine evening sessions in corporation law, general accounting, taxes, budgets, and external financing.

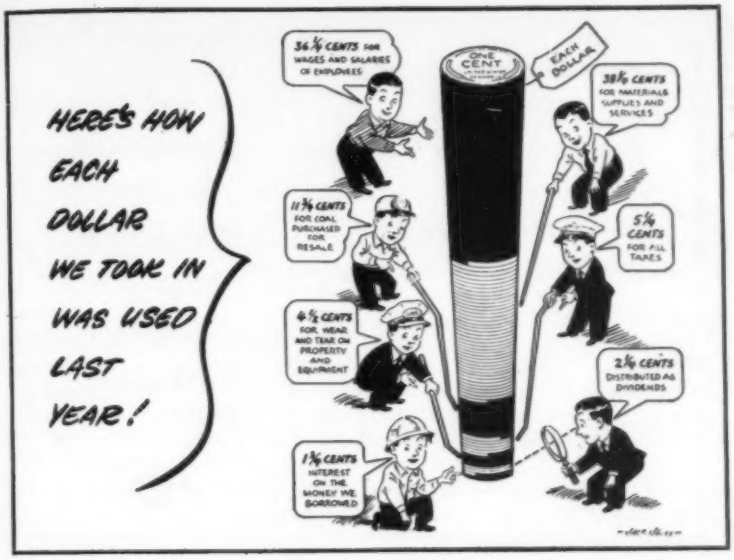
Later this year, the group will get an additional course on how to analyze financial reports. A later course in personnel relations is being considered.

"Cash flow" was the key topic that made the biggest impression on student-executives in the finance course. The company controller passed out NSP's own cashflow sheets, showing where the dollars came from and where they go.

Unlike profit and loss statements, which merely summarize overall gains and losses, the cashflow sheets told the students just how the company stood, and would stand, in its ability to pay its bills.

One thing became clear to the students immediately. This point had clouded their understanding of the proposed merger: Big outlays for company expansion could not be met by cash generated in the company. Outside dollars would be needed.

Other important topics covered were: (1) tax planning and its advantages; (2) the costing system, with a brief review of direct costing methods; (3) external financing—types of stocks, bonds, borrowing, relative advantages, disadvantages.


HERE'S HOW EACH DOLLAR WE TOOK IN WAS USED LAST YEAR!
36¼ CENTS FOR WAGES AND SALARIES OF EMPLOYEES
ONE CENT
EACH DOLLAR
38⅛ CENTS FOR MATERIALS SUPPLIES AND SERVICES
11¾ CENTS FOR COAL PURCHASED FOR RESALE
5⅛ CENTS FOR FUEL TAXES
6½ CENTS FOR WEAR AND TEAR ON PROPERTY AND EQUIPMENT
2¼ CENTS DISTRIBUTED AS DIVIDENDS
1¾ CENTS INTEREST ON THE MONEY WE BORROWED

A CARTOON like this—used by Eastern Gas & Fuel Associates Co.—can help you tell employees the story of your company's finances.

Try Reports to Workers

Digested from INDUSTRIAL MARKETING, Dec, p54

You probably send a complete annual report, or at least a financial statement, to each of your stockholders. You want to keep them informed, keep them interested, keep them satisfied with company progress. You want to keep their morale high and invite their full cooperation and avoid their complaints. So you give them a written review each year of your over-all situation as to income, expenses, products, sales, research, markets, expansion.

Have you thought about an annual report for employees? Surely, they, too, need to be kept loyal and interested and satisfied in the business. Moreover, you certainly do not want your workers' entire impression of your business and profits to be based on what they are told by the union, or on what they hear by way of washroom gossip and rumor!

The number of employee annual reports issued by private companies is not known. Their use is spreading quickly, however, according to the experts. Usually they appear as special issues or added sections of employee publications.

In 1955 several employee reports appeared in a complete "report-review format." The essentials of the profit-and-loss statement were shown, plus a pictorial review of the year's progress and accomplishments.

Esso Standard Oil Co., for example, distributed its "Highlights" to employees. It was a well organized review of the year's activity, with easy-to-understand statistics and predictions for the future.

Aluminum Co. of America, whose employee reports are rated among the best, used several ways to get information across to workers—a simplified financial statement, a color moving picture showing company activities, and group meetings of employees.

A word of caution is in order for those who have had no experience with employee reports: It is doubtful whether copies of the stockholders' annual report should be distributed to employees. Your best approach is probably a separate report, one that is "dramatized and humanized and slanted to the specific interests of employees."

How Handicapped Can Earn Their Way

Digested from SALES MANAGEMENT, Dec 1, p65

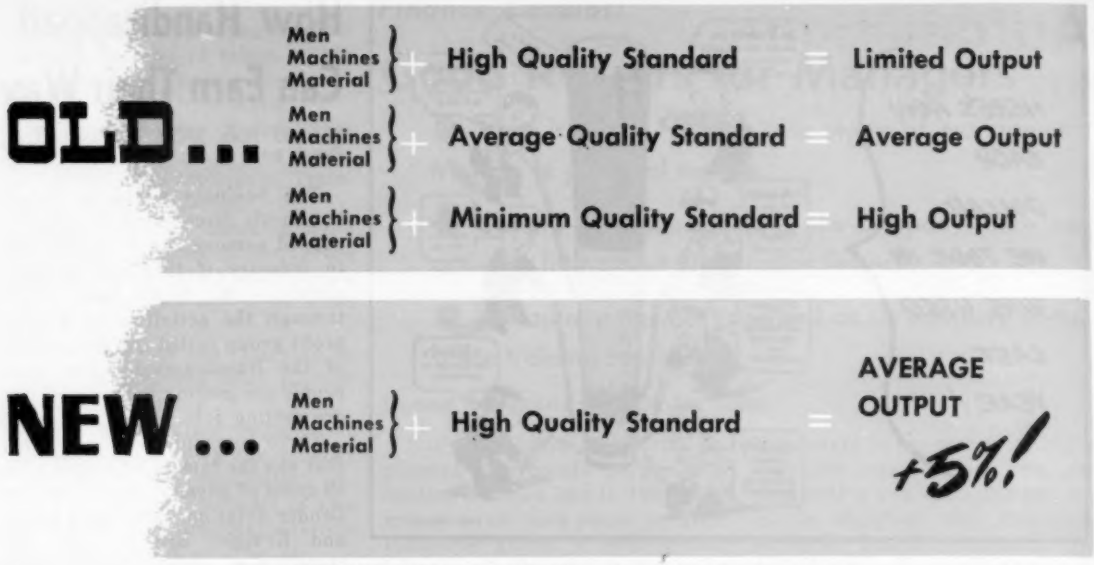
The business world is slowly but surely discovering that handicapped persons can do a good job in industry if they are given a chance. In New York City, through the activities of a nonprofit group called the Federation of the Handicapped, many such people are getting a chance. They are getting jobs.

Three companies, among many, that use the talents of people with all types of physical disabilities are Bendix Aviation, Remington Rand, and Krueger Brewing Co. All three say that handicapped workers truly deserve careful consideration on the part of employment managers. This view is supported by a growing number of employers in New York and throughout the U. S.

Many of these concerns cooperate with the Federation, which acts as a sort of training ground and employment agency for the handicapped. Employers have found that deaf mutes, polio victims, and other crippled persons are usually excellent workers. They take their jobs seriously and are skilled performers once they have been trained. They are absent due to illness less than are average workers. Their morale on the job is high.

Remarkable skills are developed by physically disabled persons. At Remington Rand, for example, workers have been trained to operate special typewriters with only one hand. When properly trained, such people can type 50 words a minute.

Work at home is being done more and more by the handicapped who are unable to travel easily to and from jobs. Office work is done economically and efficiently: typing and mailing, handling advertising material for direct mail, form letters, credit and collection notices, etc. In New York, the Federation serves as a clearing house for much of this work.



NEW Wincharger incentive plan is cost-free, simple, effective

Boost Quality—Retain Volume

Digested from FACTORY MANAGEMENT & MAINTENANCE, Jan, p126

The rule book says that if you raise quality standards, you decrease output. If you want higher quality you must either (1) slow down your rate of production, or (2) suffer the expense of having more "rejects" turned out on each production run.

That particular section of the book has recently been rewritten, at least as far as Wincharger Corp. of Sioux City, Iowa, is concerned. Wincharger is getting higher quality and moderately higher output with no increase in cost. Production has jumped 5% and, moreover, the number of inspectors needed to check production has been cut in half.

A unique incentive pay plan—a "quality incentive device"—was developed by Wincharger two years ago. It is applied "on top of", or in addition to, the company's regular incentive wage bonus that is paid for extra production. Defects have been ironed out and the plan has proved itself. It works this way:

As long as the quality standard is met, the output of a production crew, averaging 30 men, is only sample-inspected. This partial "spot checking" requires just one inspector.

But when the crew's quality goes below standard, additional inspectors, usually two, are called to the job. When this happens—and here is where the quality incentive comes in—the crew must absorb the cost of the two extra inspectors. The added cost is charged against the crew's production incentive bonus. This, of course, reduces their bonus wages.

In an example given by Wincharger, a crew of 29 men worked 232 man-hours in an 8-hour day. Their output was 9.9% above the fixed production standard. This would normally have meant a wage bonus of about 10% above standard wages. However, because the crew's quality was being 100% checked, the wage bonus was reduced to 3%.

Workmen at Wincharger have been quick to appreciate the cash-value of maintaining high quality. Crews usually manage to bring their quality up to standard within one day, thus eliminating the extra inspectors from their payroll.

The idea could be applied by many companies in many lines of business, according to Wincharger executives. Company operation is typical: producing chassis units for table-model radios and clock radios. The concern is medium-size. During the year, between one and seven crews of about 30 workers each are employed under the dual incentive system. Average for the year is three crews.

Three additional points are emphasized by Wincharger:

- Provision is made for defects or obstacles that are beyond the control of the work crew. For example, if material is inferior and quality is affected, 100% inspection is called for, but the extra inspectors are not charged to the working crew.
- Time standards were not changed in any way when Wincharger set up its new system.
- Training-time allowances are part of the plan. They compensate for the fact that it takes time to bring quality up to standard (1) when inexperienced men are added to a work crew, and (2) when new or revised models of the product are being worked for the first time.

Automation: No Threat to Office Jobs

Digested from AMERICAN BUSINESS, Dec, p24

Office employees, especially those who do routine jobs, are being scared a lot these days by depressing talk about automation. Labor leaders, especially, are picturing automation as a robot-threat to the security of the "white collar worker."

Are these dire predictions based on fact? Will white collar people really have their place in industry swallowed up by electronic brainpower? . . . A clear "no" is probably the safest answer to both of these questions.

A survey of 300 companies throughout the U. S., large and medium-size, was conducted by *American Business*. The idea was to get a concrete answer to the automation "threat"—based on actual experience in industry.

Only concerns that adopted some form of "office automation" in the past five years were contacted. Here is a sum-up of reasonable conclusions based on survey information:

1. No threat to the security of white collar workers is evident in U. S. industry. In fact, the reverse is true. Actually, in each of the 300 concerns surveyed, more people were employed in paperwork or office activities than before the automatic equipment was installed. White collar employment increased from 2 to 10%.

2. Automatic equipment speeds operations remarkably and presents great opportunities to efficiency-minded management. But it only makes possible the use of more people more efficiently. It is not payroll savings which makes such equipment attractive, but increased production of data information at lower unit cost and in detail not now practical.

3. Upgrading of office personnel with a consequent rise in pay scales is already clearly evident. In over 90% of the cases surveyed, where workers had been shifted to other office jobs, the employees were doing a higher or more skillful type of work than before.

Greater opportunities exist for workers in offices that have adopted automation. Their chances for advancement are greater. Their job interests and abilities are improved.

4. Displacement—the transfer of employees within the company—is bound to take place. But this does not mean loss of either seniority or pay. However, this situation can cause much real employee insecurity if planning, education and retraining are not carefully worked out in advance.

5. Management must develop a workable program for relieving the fears of supervisory employees. They, more than rank-and-file workers, fear the loss of status, seniority, and rank. Effective office automation needs the full cooperation and abilities of a competent force of supervisors. In all of the 300 cases surveyed, this force was developed from clerical supervisors already employed by the company.

6. Outside "experts," except for initial training, have generally not been needed. The retraining of current personnel has been found most practical. Employee-attitude and employee-security nearly always improved greatly once the new equipment was installed and the new routine established.

7. Rumor is destructive and can undermine the morale of the workforce unless clear-cut information is made available by management. This applies most clearly in the case of a company planning new automatic equipment. "Rumors must be countered before they arise."

8. The "human factor" remains in offices in spite of automation. In fact, automated offices depend even more upon human skills and abilities than they would otherwise.

To the right are some of the comments businessmen have made about automation in the office.

"We have accomplished a great deal in this direction, but our program has not resulted in any serious employment displacement . . . The employees in the offices in which we intend to install high-speed digital equipment know of such an arrangement many, many months in advance . . . We prepare our employees for the new jobs that will become available with such equipment. Special training classes are arranged."

—George H. Albach, comptroller, New York Central System

"The impact of electronics will be more in the nature of job shifting than permanent unemployment."

—A. B. Toan, Jr., Price Waterhouse & Company

". . . as a whole, electronics will benefit the white-collar worker . . . these complex machines will create new, more complex jobs, or make some of the present jobs more involved. This will have a tendency to add to the number of officeworkers at the higher end of the wage scale . . . automation in the office will tend to increase the average pay of the white-collar worker."

—J. D. Elliott, general superintendent of Revenue Accounting, The Detroit Edison Company

". . . experience in electronic data-processing applications is showing that employment of white-collar workers is seldom reduced after installation of electronic data processing. New assignments are made. New services are provided . . ."

—Weldon B. Gibson, director of Economics Research, Stanford Research Institute

"It has always been our policy to see that jobs are available for the people, before we introduce changes of this sort."

—D. F. Howe, manager, Management Methods Research, The Proctor & Gamble Company

Save Time, Money, Promote Efficiency . . .

Let a Camera Do the Job

Digested from FACTORY MANAGEMENT & MAINTENANCE, Jan, p78

"One picture can take the place of a thousand words." The truth is, for a great many jobs in industry, a picture can produce a better result than a thousand words. Ryan Aeronautical Co., San Diego (Calif.), has proved the point.

Ryan has developed some camera uses that are new, unusual and profitable. Here are five picture ideas that have saved time, money and lives for Ryan. They are good ideas and can be easily adapted by any plant.

Visual training is made easier and cheaper by the use of grouped photos. (See picture above.) For example, it would cost too much, in damage and breakdown, to let untrained workers learn from using actual tools. Ryan substitutes photos. Principles and operation of machine tools, etc., are also explained to new workers with the aid of pictures.

Damaged shipments that arrive at the plant are quickly photographed. The shipment is returned promptly, with copies of a written damage report and photos showing the condition upon arrival. Employees in the receiving department have strict orders: "Do not touch until pictures have been taken!"

Templet layouts are another camera subject. Money savings amount to hundreds of dollars daily. Paper templets (patterns) corresponding in size and shape to metal parts are laid out on a large sheet. They are then moved about until the design gives the largest possible number of parts per sheet. The layout is photographed. One minute later, a picture-pattern is ready for the operator to follow in cutting metal parts.

Safety in the shop is promoted by the use of motion pictures. Ryan films 5-minute dramas that reproduce accidents in the plant and show proper prevention. Potential accident situations are also filmed. Pictures are shown at monthly safety meetings. Ryan has worked as many as 5-million man-hours in a busy plant without a diasabling injury.

Employment interviews are made faster and more meaningful to the job applicant by means of pictures. Photos are used to explain types of jobs, duties, etc. A loose-leaf folder of 8x10-inch photos is used by the interviewer.

Over 15,000 Companies Support Research in U. S.

Digested from BUSINESS WEEK, Dec 31, p55

Scientific research in the U.S. is not limited to giants like General Electric, Du Pont and Sperry Rand. Thousands of small companies, too, are supporting the general effort to create better things for modern living.

The National Science Foundation reports that more than 15,000 concerns are contributing to the nation's research and development effort. Of these, about 13,000 have less than 500 employees. More and more smaller firms are starting their own research programs.

The electrical equipment industry and the aircraft industry lead all others in the scale of their research and development programs. Most of their effort goes into perfecting old products and developing new products.

In basic research—which the National Science Foundation defines as projects not related to specific products or processes—the chemical industry far surpasses all other industries in money spent. There are a half-million engineers and scientists in the U.S.; 157,000 of these are working in research.

New

Taking inventory was always an annual headache to executives at Ciba Co. Inc., New York affiliate of the Swiss drug firm, but no more. Ciba now has a new method that eliminates much preparation, overtime work, and many of the usual troubles associated with the job.

Telephone communication is the key to the system. By means of two closed-circuit telephones, warehousemen are connected with clerks at the central stock record desk. Both have telephone headsets. An easy check-off system is followed. It is quick, accurate, simple, especially with fast-changing stock items.

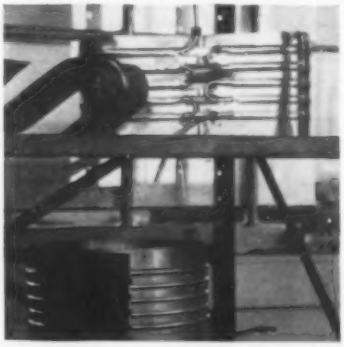
Digested from CHEMICAL WEEK, Dec 17, p86

1. RESIST RODS are put into mold before pouring molten metal.

2. CASTING is rolled into long strips. Rolling crushes rods to fine powder.

3. CUSTOMER inflates strip by inserting needle and applying pressure.

4. INFLATED CHANNEL forms a tube. Tubes can be combined.



5. TUBING can be formed into many shapes to suit application.

For Refrigerators, Radiators . . . Anywhere You Want a Tube and a Surface . . .

Process Puts Tube Inside Metal Strip

Digested from BUSINESS WEEK, Jan 7, p48

The pictures show how Revere Copper & Brass, Inc., incorporates hollow tubing between top and bottom surfaces of a single sheet of metal. The new product is called Tube-In-Strip.

One of its most appealing features is its price. Tube-In-Strip made from copper and its alloys costs little more than a sheet or strip of metal of corresponding size. Cost is much less than buying a sheet of metal and then attaching tubes to it.

The new material is expected to be used for refrigeration, air conditioning, automobile radiators, chemical and food processing, as well as radiant-panel heating, water heaters and coolers.

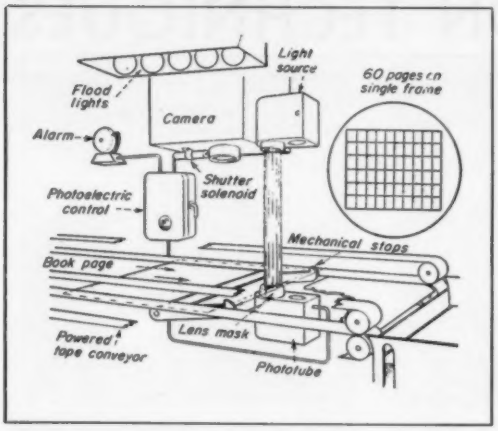
Two other companies — Olin-Mathieson Chemical Corp., and Reynolds Metals Co.—have products that resemble Tube-In-Strip, but they are made differently. In their process, tubing patterns are printed on two separate sheets. The sheets are then bonded by rolling, leaving the tubing circuit enclosed. Revere's product comes in sheets with the tubes running in parallel lines along the length of the sheet.

Tube-In-Strip is processed from a specially treated casting in about the same way as the standard strip and roll products of mills. Channels that are later expanded into tubes are contained in the sheet.

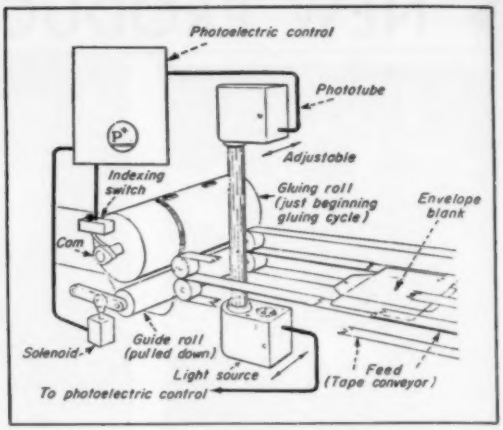
The tubing pattern is imparted to the sheet by means of rods known as resists that are set in the metal castings (see 1 above). The rods crush to a fine powder during rolling to form channels in the sheet.

Castings are removed from the molds, given a hot-soak in a furnace, and then passed through hot rolls that reduce its thickness to ¼ inch. Cold rolling further reduces the strip's thickness. The product is slit and shipped to customers in coil form.

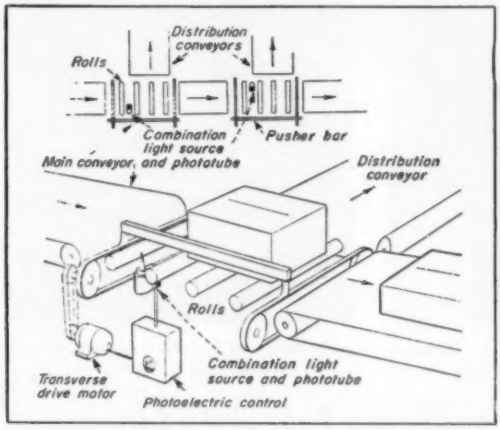
When the customers receive the rolls of Tube-In-Strip, they have to inflate the channels. They do this by inserting needles into the ends of the tubes and then applying air pressure for thin walls, and hydraulic pressure for heavier gauges.



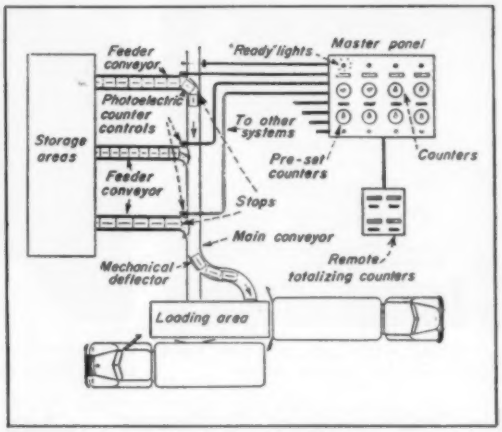
1 **Photocell control prevents misalignment of book pages being automatically photographed**



2 **This setup keeps guide roll clean by separating gluing and guide rolls when envelope feed skips**



3 **Cartons are sorted automatically into three different types by two photocell arrangements**



4 **Automatic distribution system feeds and counts cases as they are collected for individual orders**

Photocells Can Make Hard Jobs Easy

Digested from PAPER INDUSTRY, Dec, p850

Photoelectric cells are doing more and more important jobs in the paper industry. Their use ranges from simple counting to elaborate sorting and changing of mechanical movements.

The basic equipment consists of a light source, the cell, and electronic timers and relays as required by the application. The four examples illustrated are typical of possible arrangements.

• **Automatic alignment** for photographic reproduction (Fig. 1) uses a photoelectric controller and an electronic timer. The job is to photograph complete books, page by page, with an automatic high-speed camera. Pages feed under the camera on a tape conveyor. Mechanical arms stop them momentarily in photographing positions.

But often a page is incorrectly aligned as it moves into position. The photocell setup detects the misalignment immediately. The phototube, placed under the conveyor, cannot pick up the light beam when the page is in its proper position. But even slight misalignment blocks the light beam; this prevents operation of the shutter solenoid and rings an alarm.

• **A fully automatic machine** for folding and gluing envelopes (Fig. 2) needed a protective control to keep glue off its rollers when the feed of envelopes skipped. Otherwise, the gluing roll would continue to rotate and apply glue to the bottom guide roll. The guide roll would then smear the next envelope blank.

With the photoelectric control, each paper blank on the tape conveyor breaks the light beam at the instant that a cam, geared to the gluing-roll shaft, closes a switch. If the feed skips and the light beam is not broken, the switch operates a solenoid that retracts the guide roll from

the gluing roll for that cycle.

• **Automatic sorting** of products by photoelectric arrangement is under constant study in the paper industry. One manufacturer of cartons has applied it in a fairly simple manner (Fig. 3).

The company makes three types of cartons. When they are conveyed from the manufacturing area to the warehouse, they must be sorted and sent to their own storage areas. As each type of carton varies in dimensions, sorting cannot be done by size and shape. Before the automatic system was devised, two men were needed to push cartons from the main conveyor to the proper distribution conveyors.

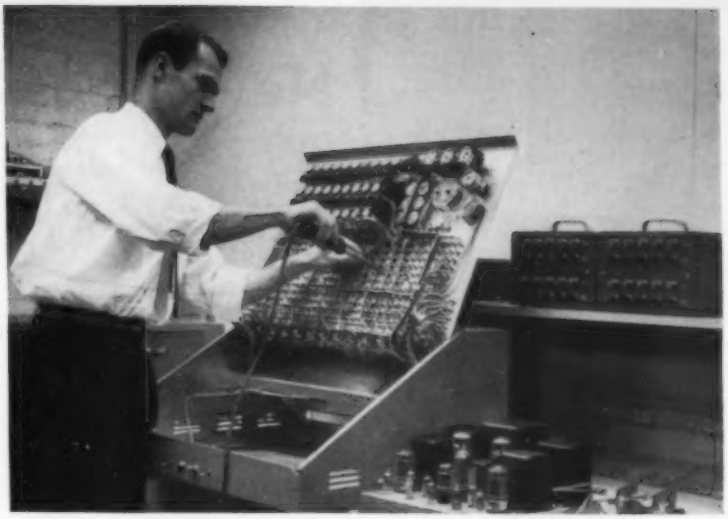
Two photoelectric controls now handle the sorting. One is at the right-hand side of the main conveyor at the first discharge point, the other at the left-hand side at the second discharge point.

One type of carton has a small strip of reflecting tape on one side of the carton bottom, the second type has tape on the other side, the third has no tape. As the cartons pass down the conveyor, the reflecting tape actuates the proper photocell, causing a pusher bar to operate and remove the cartons. Cartons without tape pass to the third distribution conveyor.

• **Another factory** needed a reliable automatic device (Fig. 4) to count and sort containers making up a single order moving from warehouse to loading dock. Counters actuated by mechanical limit switches were not accurate enough.

The new system has feeder conveyors leading to the main conveyor. Each feeder conveyor is equipped with photoelectric control at its junction with the main conveyor. When a case passes the beam, the photocell operates two counters, one a totalizing counter and the other a predetermining counter.

When the required number of cases passes the photocell, the predetermining counter, previously set by the operator, stops the conveyor and lights a control panel lamp to indicate that part of the order is filled. This process is repeated for each type of case ordered by selecting proper feeder conveyors and counters.



FIRST you buy the kit. Then you put it together. It's a . . .

Do-It-Yourself Computer

Digested from CHEMICAL WEEK, Dec 31, p70

The craze for ready-to-assemble kits hit the U. S. first, but the idea is spreading. Now, it's a kit for an electronic analog computer. Heath Co.'s (Benton Harbor, Mich.) kit is designed to take computers out of the heavy-capital-investment class.

A computer's maze of wires and components may seem too forbidding to tackle. But, as Heath points out, the computer is assembled with building blocks—amplifiers, multipliers, function generators. Individually, they are not too difficult to be handled by the average technician who can use a soldering iron and follow directions. Assembly time—about 220 manhours.

Completely assembled, the basic computer houses 15 amplifiers, 30 null-balanced coefficient potentiometers, 2 auxiliary 10-turn potentiometers, 6 floating initial conditions, 4 dual base diodes, 4 multipliers, 2 function generators, 22 external connectors, 1 metering circuit with dividing network, and 2 operational relays. Printed circuits simplify construction.

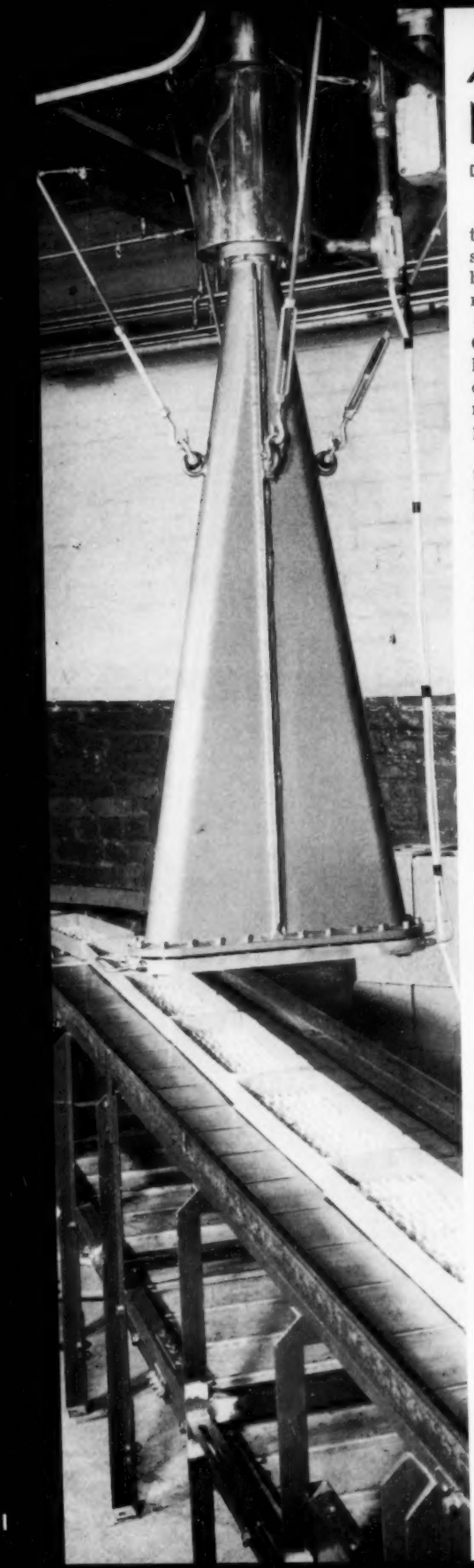
A readout meter insures a high degree of accuracy for the computer. It is primarily required for the reading of amplifier outputs, initial conditions, and other voltages. It also serves as a means of accurate calibration for other components. A null-balance network increases the sensitivity of the meter.

An innovation on the computer patchboard is the schematic layout of amplifiers. The arrangement reduces the number of patchboards required. It also provides a logical diagram when fully patched in.

The governing factor in the kit's design was cost. Many small companies and educational and research groups might balk at the high cost of conventional computers, but will not mind the kit's $700 price.

Heath also expects larger companies to be interested. Though they could afford the more expensive units, the whole idea of analog computers might be more attractive at the lower starting price. The Heath computer, slaved to an existing installation, provides additional amplifiers and auxiliary patchboard. And it can be used to pretest simple circuits to save operating time of a large complex computer.

Though the analog kit was not scheduled for marketing until the first of this month, a backlog of orders has already piled up. Heath expects a bigger backlog as engineers understand better what analog computers can do.



Atom Smasher:

New Processing Tool

Digested from CHEMICAL ENGINEERING, Jan, p114

Commercial application of radiation to chemical processing is spurred by the work being done by Bradley Container Corp. (Maynard, Mass.). With its 2-mev. (million electron volts) Van de Graaf accelerator, Bradley is sterilizing drug packages, either filled or empty, and irradiating injection-molded, mass-produced polyethylene products.

The company claims to be the first to use an electron-beam sterilizer in commercial packaging and to have the first commercial installation for irradiation and sterilization of mass-produced items. Previous to this program, use of the Van de Graaf and other particle accelerators had been restricted to medical therapy, basic physics research, and radiography of metals.

The last 2 years for machine-produced radiation have been busy ones for other companies as well as Bradley:

- In the summer of 1954, General Electric announced production of irradiated polyethylene insulating tape.
- In October 1954, Bradley Container began sterilizing empty drug packages, later extended treatment to packaged ophthalmic ointment. In the middle of 1955, Bradley began irradiating portions of polyethylene ink barrels to toughen them and prevent their cracking during assembly of ball-point pens.
- Last fall, Upjohn, an important drug manufacturer, offered for sale a radiation-sterilized drug.
- Clay Adams Co., New York manufacturer of medical equipment and supplies, recently began radiation-sterilization of surgical tubing.
- Chemical and petroleum companies are busy too. While the chemical people are keeping their work secret, the petroleum people have indicated in a general way their research efforts. All point to better products, improved petrochemical processes, and detection of otherwise undetectable petroleum reserves.

Bradley Container extrudes and fabricates all kinds of polyethylene containers. It also does filling and sealing.

For sterilization, the containers, either empty or filled, travel by conveyor under the electron accelerator. The electrons quickly and effectively destroy all bacteria inside and outside the containers without harming either the polyethylene or the packaged drugs. Empty containers are packed in sealed bags and sent to the drug manufacturer for filling.

The company prefers radiation sterilization to other methods. Steaming may damage or destroy the material and requires intermittent operation in vessels. Ethylene-oxide treatment can be troublesome as the gas is toxic and may combine chemically with the material being sterilized. Ultraviolet light treatment is slow and effective only for a low degree of penetration. Filtration can be cumbersome and messy.

Electron sterilization, on the other hand, is credited with these three advantages:

1. The product can be sterilized in its sealed package without recontamination before use.
2. Packaged or bulk material to be sterilized can be conveyed in an uninterrupted flow beneath the accelerator. This speeds processing, in comparison to the normal batch sterilization methods.
3. With a properly regulated accelerator, complete sterility can be assured in every product unit. Radiation sterilization is the only method whose effect is virtually instantaneous.

Cost of electron accelerators is higher at the outset than equipment for other sterilization methods. Volume production should reduce capital cost per kilowatt, now ranging from over $30,000 to as much as $140,000, down to $20,000 or less.

ELECTRONS from 2-mev. Van de Graaf particle accelerator sterilize drugs as they ride a belt conveyor under the electron-beam disperser

Of America's 500 Largest Companies

94% use DITTO

Fortune

The Fortune Directory of the 500 Largest U.S. Industrial Corporations

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FORTUNE MAGAZINE recently published a list of the 500 largest U. S. Industrial Corporations. Of these 469 (94%) use DITTO Duplicating equipment. These DITTO Installations represent millions of dollars saved in all phases of paperwork including such routines as order-billing, production, payroll and purchasing.

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How You Can Cut Costs With "Hi-E" Machining

Digested from AMERICAN MACHINIST, Dec 9, p121

The current trend toward cutting more and more "hard-to-machine" metals in less time demands increased efficiency. As much as 50% of the savings gained with carbide tools are often lost by poor machining. But they need not be.

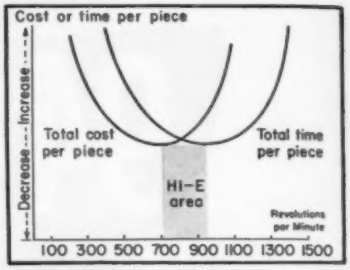
In setting up a machining job, the most efficient methods, not the tool cost, should be the prime factor. High-efficiency (or "Hi-E") machining combines a number of factors to provide a range of cutting speeds to obtain (1) the lowest cost per piece machined, (2) best tool life, (3) reduced floor-to-floor time.

The range of cutting speeds can be represented graphically. It lies in the area on a chart (right) between the lowest points on two curves—the total-cost-per-piece curve and the total-time-per-piece curve. This Hi-E area gives the best speeds to obtain minimum cost and time per piece.

To chart the Hi-E area, it is first necessary to develop two curves. The total-cost-per-piece curve is made up of three components: machining cost, tool cost per cutting edge, and nonproductive costs.

Machining cost is time multiplied by labor and overhead sum. Tool cost per edge is changing, grinding, and depreciation costs divided by the number of pieces machined per edge at different speeds. Nonproductive cost equals loading, noncutting, traverse time, etc. multiplied by labor and overhead sum. These three series of costs are plotted against speed, with the total-cost-per-piece curve the summation of the three curves.

The total-time-per-piece curve is arrived at the same way by adding three curves: machining time, tool-changing time, and non-productive time. The machining-time curve is plotted by dividing the piece length by the feed times the revolutions per minute at several speeds. Tool-changing time is established by dividing the time to change one tool by the number of pieces per cutting edge for several speeds. Nonproductive time is for loading, unloading, feeding tool into cut, and other non-cutting times per piece.


Cost or time per piece
Decrease ← Increase →
Total cost per piece
Total time per piece
HI-E area
Revolutions per Minute
100 300 500 700 900 1100 1300 1500

BEST SPEEDS to obtain lowest costs and least machining time are in the Hi-E area. Positions of the two curves showing total cost and total time per piece determine Hi-E area.

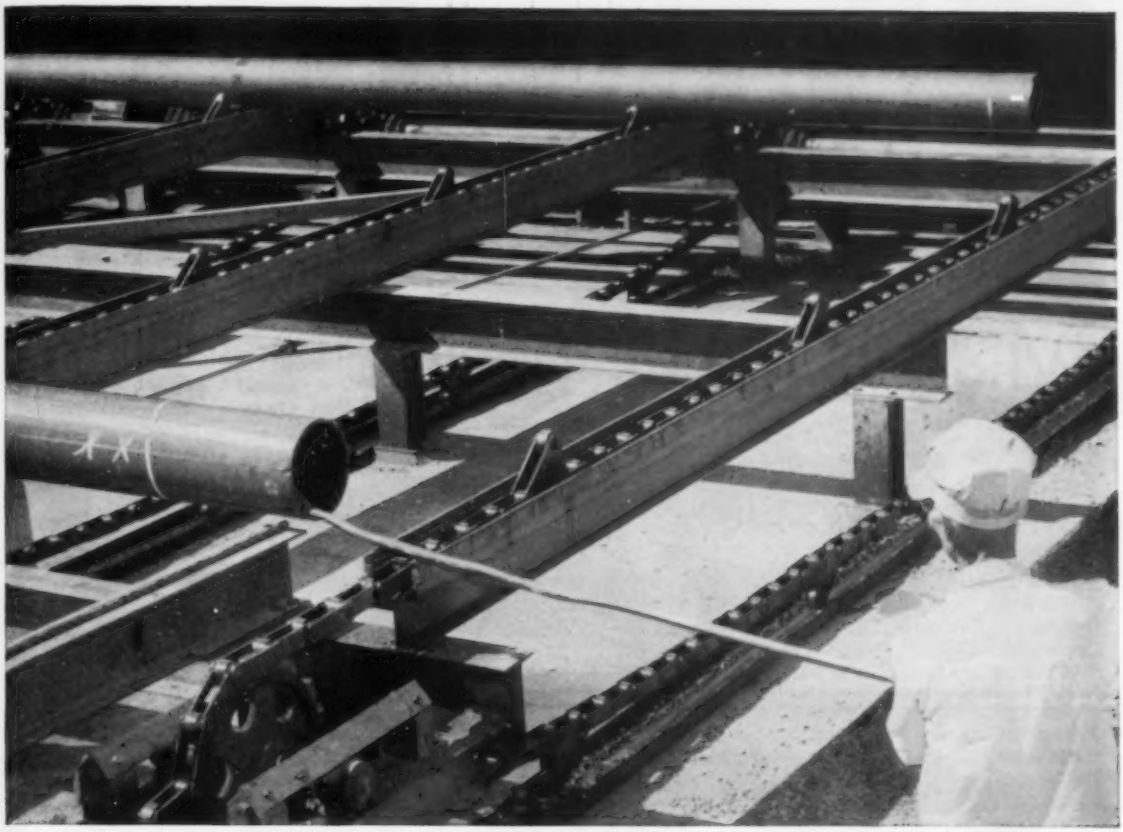
Once the Hi-E area is charted, then the speed must be picked. If cost is the only consideration, a speed within the area but as close to the left side as possible will give the lowest cost per piece. If machine investment is high and space for production equipment is limited, it may be more economical to run at a speed at the high side of the area. This would increase the cost per piece but fewer machines would be needed.

When hardened high-alloy steels, stainless steels, or jet-engine alloys are machined, doing so at minimum cost per piece would give quite low production. So it is often necessary to use speeds in the right side of the area up to the minimum-time-per-piece line.

In automatic machines, all tools should be run at a speed above the left, or minimum-cost-per-piece, side of the area. This may cause some tools to operate at substantially higher speeds.

Operating within the Hi-E area can be made still more advantageous by reducing tool-changing time and regrinding costs with mechanical holders for insert tools and throw-away carbide tips and by use of improved grades of carbide.

LXS is the chain for this job



Transfer conveyor from inspection to cut-off at steel pipe mill uses Link-Belt LXS chain with attachments to move the heavy pipe smoothly.

Heavy loads, impact, exposure— so LINK-BELT LXS is a natural choice at steel pipe mill

Handling 40-foot lengths of pipe that weigh around 1000 pounds each is a job that demands real stamina in chain. That's why the designers of this pipe mill specified Link-Belt LXS.

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Plant map, two-way radio finds trucks . . .

When You Want Trucks

Digested from FACTORY MANAGEMENT & MAINTENANCE, Jan, p87

Now you can keep track—minute by minute—of fork trucks, tractors, and other mobile materials-handing units in your plant. How? With small magnets that your dispatcher can slide around on a plant map (photo above)—plus two-way radio. That is the way Parke Davis & Company (Detroit) does it. And here's what Parke Davis has gained:

- Split-second service for routine as well as emergency service.
- A strong boost for an already efficient handling system.
- Better utilization of mobile materials-handling equipment.

Cost? Only $65—complete.

Parke Davis's Detroit plant consists of 67 buildings spread over some 10 city blocks. Eight city streets and seven railroad sidings skirt, enter, or divide the property. All this makes materials handling big business—and complex. And it makes speed and efficiency essential in dispatching. That is where the magnetic control board comes in.

There is a small magnet for each unit of two-way radio-controlled equipment at the plant. Magnets are ½-inch in diameter, each numbered and specially colored to identify the particular unit and type of equipment represented. The control board shows all buildings, docks, railroad sidings, streets, and yard areas in the 10-block property. Buildings also are numbered and colored for quick identification.

As trucks and other mobile equipment move about servicing various buildings and yards, the dispatcher keeps in touch with them by radio, moves magnets on her board to show where each unit is.

In emergencies—or whenever speed is needed—the dispatcher wastes no time thumbing through log sheets. She just glances at her board, spots nearest available mobile unit, calls it on her radio, and speeds it to the scene with split-second timing. Even routine requests get quick, efficient service.

What about equipment that is down for repairs or not available for some other reason? A small chart at the lower right-hand corner of the board is reserved for these units. It also shows equipment on routine assignment that does not have to be tracked minute-by-minute.

To check on efficiency of materials-handling operations and provide a record of daily operations, Parke Davis uses daily log sheets and special recorders.

The board was built right at Parke Davis. The plant-layout drawing (made to scale) was placed on a sheet of 14-gage galvanized iron and covered with a thin sheet of picture glass. Magnets are strong enough to stick on the tilted surface of board.

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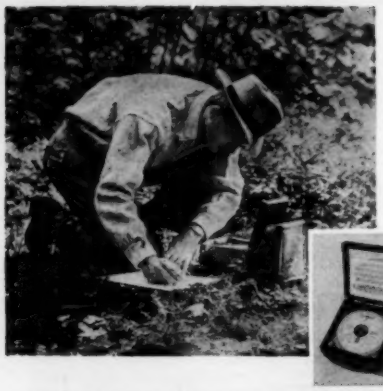
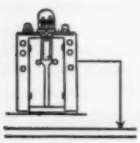


Where Performance Counts

WALLACE & TIERNAN EQUIPMENT IS USED

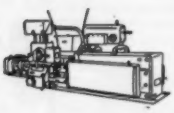
PRESSURE SENSITIVE INSTRUMENTS

The W&T Sensitive Altimeter, shown above, was used on a reconnaissance survey where quick, accurate results were required. The W&T Altimeter was chosen because of its dependability, rugged durability and high order of accuracy. These qualities are typical of all W&T's aneroid and mercurial pressure sensitive instruments, many of which are used in exacting research work and production testing.



CHLORINATION

Equipment includes chlorinators of both the water and mechanical diaphragm types in all capacities, hypochlorinators, and many other auxiliary and accessory items designed for use in the treatment of water for sanitation as well as for numerous industrial purposes.



PROCESS FLOW CONTROL

Equipment includes chemical solution feeders, gravimetric and volumetric dry feeders, and gravimetric meters for use in the chemical, grain, and food processing industries.

AIDS TO NAVIGATION

Includes a number of protective devices for navigation such as buoys, lamp changers, flasher mechanisms, signal timers, fog horns, aircraft flasher units and other related apparatus designed for use in the marine and air transportation field.

Other quality Wallace & Tiernan products and services used throughout the world are listed below. For further information send for list number F-104 of available free technical publications on all Wallace & Tiernan products.

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REPRESENTED IN MOST COUNTRIES

F-104

Synthetic Rubber Planned for Britain

Digested from RUBBER & PLASTICS AGE, Dec, p717, 725

Late last fall Dunlop Rubber Co., Ltd., announced it was forming the International Synthetic Rubber Co. Ltd. Its object: manufacture of general-purpose synthetic rubbers in England. Initial production will be about 50,000 tons of GR-S per year and should start in 1958. Three other British tire manufacturers have an interest in the synthetic-rubber venture. They are Goodyear (Great Britain), Firestone and Michelin. Other companies are being invited.

The significance is this: Britain, and segments of the British rubber industry in particular, has long been the strongest supporter of natural rubber. But now, caught in a price squeeze with the natural material and faced with a rising demand, Dunlop has broken down the last barriers faced by synthetic rubber.

While the British plant will concentrate at first on GR-S synthetic, it will be sufficiently flexible for the production of the newer types of cold rubbers. U. S. synthetics manufacturers have come up with a material that reproduces the natural rubber molecule. Here also, the British plant is expected to be adaptable.

Fifty-thousand tons per year will account for about one-third of the total requirements of the British tire manufacturers. Presumably this is the minimum amount possible, but it is expected that at least 100,000 tons will eventually be produced. This would:

- Safeguard Britain in the event that its natural-rubber supplies from the Far East were cut off.
- Allow for an increase in tire production.
- Enable some to be exported.

A new German plant is also expected to be in production by 1958. It will therefore be a race to see whether Germany or Britain captures the export markets first. This in itself is significant. Britain is feeling the intense competition from Germany in export markets. It cannot afford to allow this market to go by default.

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XR156

Sugar Research Finds New, Valuable Uses

Digested from CHEMICAL ENGINEERING, Jan, p142

The evidence is now in—an important organic chemical industry based on sucrose and its products is taking shape. Much of the credit belongs to the Sugar Research Foundation for sponsoring these projects:

- **Nonionic Detergents**—A commercial process has been announced for making sugar-based detergents (MD, Dec '55, p22).
- **Livestock Feed**—Just one step behind the detergents on the road to commercial reality is a process to make a cattle feed by ammoniating beet pulp.
- **Drying Oils**—Sucrose-linseed oil fatty-acid esters have been synthesized by National Lead Co. They give highly superior paint films. Drying is rapid. Film hardness is satisfactory.
- **Resins**—Reductive aminolysis of sugar, developed at Pennsylvania State University, may bring sugar into the field of high polymers. Reaction of sucrose, ammonia, and hydrogen yields 2-methylpiperazine, a starting material in resin and fiber production.

New

Soldering glass and other materials—aluminum, stainless steel, ceramics—without special equipment can be done by a method developed at University of California's Los Alamos Scientific Laboratory.

The wheel of a hand grinder is preheated by grinding steel with it (or external heat may be applied). Then the wheel is ground into a soft solder, such as 60-40 lead-tin, which melts and loads the wheel. The solder-loaded wheel, applied to the surface to be soldered until a slight abrasion occurs, flows the solder over its surface. After this tinning operation, soldering is done in the usual way with standard 50-50 lead-tin solder.

Digested from AMERICAN MACHINIST, Jan 2, p121

HOW TO BUY AN

Accounting Machine

1 An accounting machine is no better than the system of which it is a part. The *perfect* system is one designed with your specific needs in mind. Your first step in buying an accounting machine, therefore, is to have a survey made of your accounting operations. This survey should include a study of your policy, methods, problems, prospects and objectives. Only upon the completion of such a study, followed by an analysis of the findings, can recommendations be made for giving your accounting department the benefit of mechanical efficiency.

2 Obviously, such a survey must be conducted by a specialist in the business of serving business – the man from Remington Rand. In recommending a program for mechanizing your accounting department, your Remington Rand representative draws upon the world's richest storehouse of business experience. Experience gleaned from thousands upon thousands of case histories. Experience accumulated over a span of 81 years.

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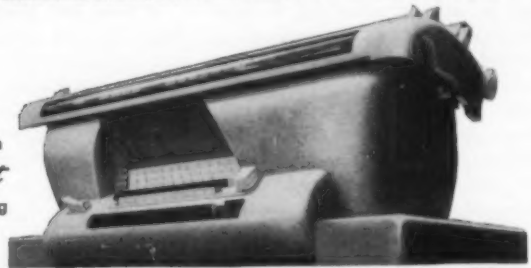

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● "Buy Today, Pay Tomorrow!" is the cry of retailers from Cardiff to Cairo, from San Francisco to Sanitago

● In the U. S.—where even honeymoon trips are bought "on time"—consumers pay 11½% of income on past purchases

● British "hire purchase" stimulates increasing sales of appliances and autos—in spite of government curbs

● Credit investigation is becoming a major concern of retailers around the world. A new variation added in Germany . . .

Consumer Credit Spreads Worldwide

Digested from THE WALL STREET JOURNAL, Dec 22, p1

Retail sales levels rise to dizzy heights with the aid of fast-moving consumer credit. That fact is being eyed more and more closely by businessmen the world over. "Expand the market . . . let them buy on the installment plan!"—such is the new motto of retailers in Europe, Latin America, Africa, Asia.

Facts they have learned about the U. S. economy, with its emphasis on consumer credit, have spurred the world's businessmen to try the method on their home grounds. Here are some far-flung developments that show what is taking place:

• **Egyptian businessmen** are advertising in Cairo's daily paper, El Ahram, to attract buyers of radios, refrigerators, washing machines. An easy-payment plan is offered. Customers are given extra-long credit terms, plus discounts on every second purchase. Payments for refrigerators, etc., can be spread over 38 months. Down payments are very small.

• **British customers** are going further and further into installment debt. The Hire Purchase Trade Assoc. reports installment contracts entered into in the first ten months of 1955 were running at a rate over a million a year despite credit curbs imposed by the government.

• **West German retailers** sold over 3-billion Deutschemarks (over $710-million) worth of wares on the installment plan in 1955—five times more than four years ago.

• **Australian economist,** Prof. H. W. Arndt, figures installment debt in his country rose to $400-million in mid-1955—37% higher than a year earlier and ten times greater than in mid-1948.

• **Mexican sales** of radios and other electrical appliances have increased substantially in recent months. A leading marketing executive says that installment credit is the reason for at least 50% of the increase. The same is true for Cuba and Venezuela, he says.

• **Brazilian auto distributors** are finding that installment buying is becoming more and more important to their business. In Brazil, 62% of auto sales last September, of one leading car, involved long-term credit. A year and a half earlier the figure was only 40% of a considerably smaller total.

• **Near and Middle Eastern markets** in 1955 absorbed over 3,000 air conditioners shipped by one large American exporting firm. Five years ago the firm sent only about 1,000 air conditioners to that area. More widespread installment selling is the reason for much of the increase—so say export executives.

• **A U. S. financial institution,** The C.I.T. Financial Corp., entered the consumer credit field in overseas markets many years ago. In the early 1930's it withdrew because of currency controls and has never reentered. Today, C.I.T. is busy "exporting knowledge" related to consumer credit.

In recent months, C.I.T. has conducted study courses in New York on consumer credit for the benefit of overseas businessmen. Danish and German bankers, and Belgian industrial executives have attended.

Corporations with their home base in the U. S. frequently finance consumers abroad. These are concerns that have subsidiaries overseas—such as the giant retailer, Sears, Roebuck & Co.

Sears operates 31 large stores in several Latin American countries. Each has its own credit department. Nearly 40% of the sales of these stores are on an installment basis. That is about the same percentage Sears has built up in the U. S., where an average of one out of every seven families owes Sears money.

Sears had not a single store abroad before World War II. The company's credit operation in its overseas stores is described by executives as "very satisfactory."

Credit investigation is a major retailing activity in the U. S. The applicant for installment credit is checked in his community to insure that he is trustworthy and responsible. Bank references, employers, etc., are contacted. The business of checking credit has

become, in itself, a big business.

There are many firms, of course, that do nothing but service retailers who do not perform their own credit investigations. Some of these investigating companies, and "credit-rating" houses, operate in all sections of the world. For example, there is the American Foreign Credit Underwriters Corp. which functions on a worldwide basis.

The Kundenkreditbank of Dusseldorf, one of Germany's largest consumer financing concers, has found a solution to the credit-rating problem. It grants personal credit to those who qualify. It then gives the customer a pad of special checks. These enable the person to buy "on time" from any of 4,000 German shops that have a credit-rating arrangement with the bank. The retailers do no credit investigation of their own.

Inflation Threat in U. S. No Longer Top Problem

Digested from BUSINESS WEEK, Jan 14, p23

Washington officials in charge of the nation's Federal Reserve Banking System, have decided that inflation no longer ranks as their "Number One" problem. They believe the crest has been reached.

On one hand, they feel that today's level of business activity is too high to call for any relaxing of present credit restrictions. On the other hand—and this opinion is one of caution, not alarm—they feel that further credit restrictions are not needed. They have seen just enough "uncertainty" in the business outlook and level of activity to be convinced that more tightening-up of credit would be unwise.

During 1955 these Washington officials took some of the steam out of inflationary pressures. Four times they raised interest rates to restrain credit, and thus dampen inflation. They have gone far enough, they believe, and wish similar good luck to monetary officials throughout the free world—who are themselves wrestling with varying degrees of inflation. (See Financial Digest, top right.)

▶ FINANCIAL DIGEST

Inflationary pressures are building up everywhere as the boom rolls on. In country after country, businessmen face shortages of labor and materials, and see rising prices.

Britain, Brazil, Chile, the Netherlands, Sweden, Turkey, Australia, Argentina, the U. S., the Philippines—and a score of others—are fighting varying degrees of inflation. **Even France,** where prices have been remarkably stable, seems headed for a bout with the inflationary spiral.

Businessmen's biggest questions are: **"How far will my government go to control rising prices?** Will control of inflation in 1956 require only a modest interference in my business? Or will it bring strict, difficult regulations?"

There is this factor to consider: **More and more governments are fighting inflation by indirect methods—controls on money and credit**—rather than by direct regulation of imports, production, prices, wages.

It is not always an easy task. **Britain has yet to be successful in controlling inflation by monetary means alone.** Some Britons believe that direct controls—for example, stricter import regulations—may be unavoidable soon. Meanwhile, British bankers, businessmen, investors are uneasy about the outlook. (You see that in the prolonged stock market slump.) And **traders have given up hope of formal sterling convertibility in 1956.**

✦ ✦ ✦

A unique school for students of economic development has just opened in Washington. Enrollment is restricted.

To be admitted, one must be from 30 to 50 years old; must speak English—as a matter of convenience; must be occupied at present in either financial, industrial, or agricultural planning . . . and, most important, must represent his government as a "senior official."

The school, established by the World Bank, aims at helping less industrialized nations solve problems of economic planning and administration. Techniques developed by planners throughout the world are reviewed. The new Economic Development Institute is headed by Prof. A. K. Cairncross, on leave from Scotland's University of Glasgow. There are 14 countries represented, thus far, including **Pakistan, India, Japan, the Philippines, Thailand, Mexico.**

Overseas investors and traders will benefit, too. The program should eventually help create in many areas what businessmen call a "favorable climate" for investment.

A more favorable investment climate, incidentally, is a major objective of Brazil's new president. Senhor Kubitschek says he will take a modern business-like approach to the problem of making his nation a safe and profitable place for foreign capital. **He plans to stabilize the currency and**—among many reforms—**make a "complete revision of Brazil's foreign exchange system."**

Financial Digest, compiled from various sources, analyzes current financial trends and underlying factors.

Is "Brand Loyalty" Really Worth What It Costs?

Digested from HARVARD BUSINESS REVIEW, Jan-Feb, p116

"This is the kind I want, young man. I always trust this little label when it comes to products for the home . . ."

The lady above speaks with a consumer's authority and reveals a depth of buying habit that took her years to develop. Or should we say it took the manufacturer years to develop?

The satisfied lady customer is probably not conscious of the time and effort and money that went into building her loyalty to that "little label." But the manufacturer, you can be sure, is conscious of these things—and is constantly asking itself questions about the money so spent and the results achieved. When the company's products are in the lowest cost range, frequently purchased items like tooth paste and canned soup, then the questions relating to "brand loyalty" are of the greatest concern.

A study of brand loyalty was sponsored recently by the School of Industrial Management of the Massachusetts Institute of Technology. The study, as published, admits that not all related questions are answered for the marketing executive. In fact, it suggests that industry go much further into the question of brand loyalty. However, some major conclusions are provided—these may well serve as a starting point for management.

The survey covered a cross-section of seven inexpensive consumer products: soap, scouring powder, coffee, canned peas, margarine, frozen orange juice, and headache tablets. The buying habits of 400 families, over a three-year period, were the basis of the following conclusions:

• **Does brand loyalty really exist?** Some executives believe that the housewife buys brand items in a purely random fashion. Other executives think that long-time loyal buyers can be developed with proper promotion efforts.

The study shows that brand loyalty to individual products does exist—more, indeed, than has been realized by many marketing executives. There are many cases where 90% or more of a family's purchases have been concentrated on a single brand over three whole years.

• **Are some consumers known to be "loyalty-prone?"** Loyalty-prone purchasing means that the consumer is consistently loyal to certain brands in a number of product classes. This is of great concern to marketing men because many companies today produce several product lines. Sales strategy is affected, for example: Should one brand label be used for all company products? Or should each product be given a different identification and promotion?

The study shows that there are not many loyalty-prone families. Few housewives tend to have the same degree of brand loyalty in various product classes. Those who are highly loyal to a particular brand of one product may have very little loyalty to other brands of other products.

• **Do a large number of consumers have secondary loyalties?** That is, if they are loyal in some degree to one brand, do they also have a lesser degree of loyalty to another brand of the same product? Here is a matter of obvious concern to competing manufacturers.

The answer seems to be that there are definite secondary loyalties which influence the buying habits of about half of the family buyers.

• **Do special price offers affect consumers' loyalty?** Since reduced prices are often used in an effort to gain new customers, the relation to brand loyalty is important.

The answer is that cut-rate

prices have little effect on brand loyalty. Those loyal to a brand remain loyal; purchasing on price-cuts tends to be concentrated among people who have "low" brand loyalties.

• **Is store loyalty related?** Are families with high brand loyalty ratings likely to rate high on store loyalty?

The survey shows that no real correlation exists between the two. The results indicate, though, that some type of unsuspected relationship may exist. Thus, further study is recommended.

• **Are brand-loyal families large, small, or average users?** If rate of consumption were to vary with degree of loyalty, an important marketing factor would exist.

The study shows that there is no relationship between size of purchase and brand loyalty.

• **Is there a certain type of person who is brand loyal?** If marketing men could identify loyal types, they could add greatly to their sales skill.

The answer seems to be that there are no special economic or social characteristics related to brand loyalty. But the conclusion is subject to change.

Market strategy, promotion, and advertising can probably be improved in many companies by new kinds of market research. For example, if, as has been concluded, there are both high-loyalty and low-loyalty families within each product class, then learning more about these groups ought to be very helpful in making better sales decisions.

New

Export advertising budgets in the U. S. are way up for 1956. U. S. industry will spend about $352-million this year on new advertising to sell goods abroad. Many world markets will see stiffer competition as "ad money" begins to flow more freely.

The budget level—for both industrial and consumer ads—will average 10% more than last year. Some leading concerns are upping their budgets as much as 20%, especially in consumer goods lines.

Digested from INDUSTRIAL MARKETING, Jan, p73

Sell More the "Dynamic" Way

Digested from PRINTERS' INK, Jan 6, p28

Goods pile up on shelves easily these days, too easily. The sales executive who relies on yesterday's marketing method is asking for trouble. If he fails to change with the times, both he and his products are apt to be by-passed by sharp competition.

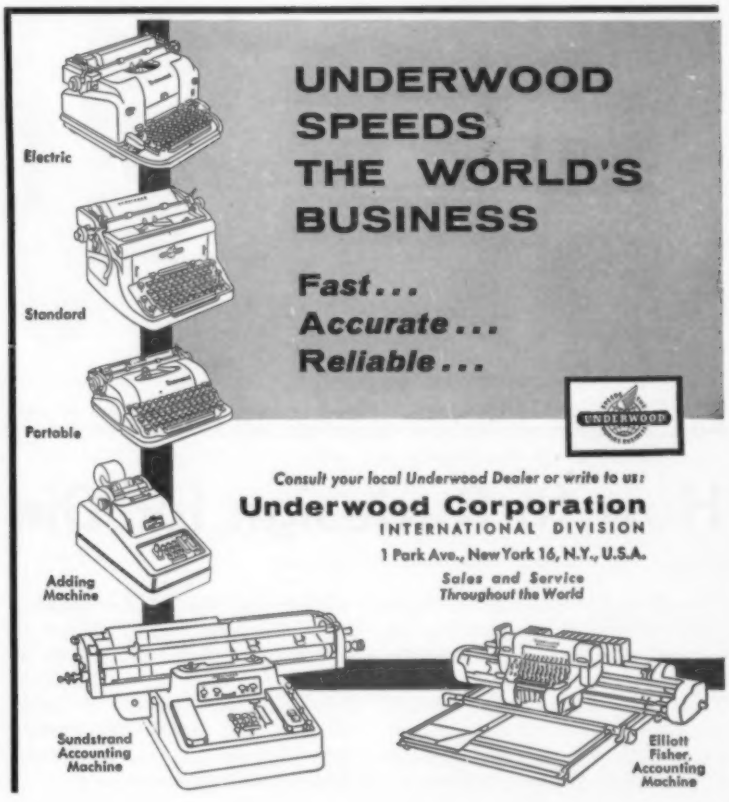
"Dynamic marketing" is the answer to the threat of fast competition. There are four chief principles to keep in mind:

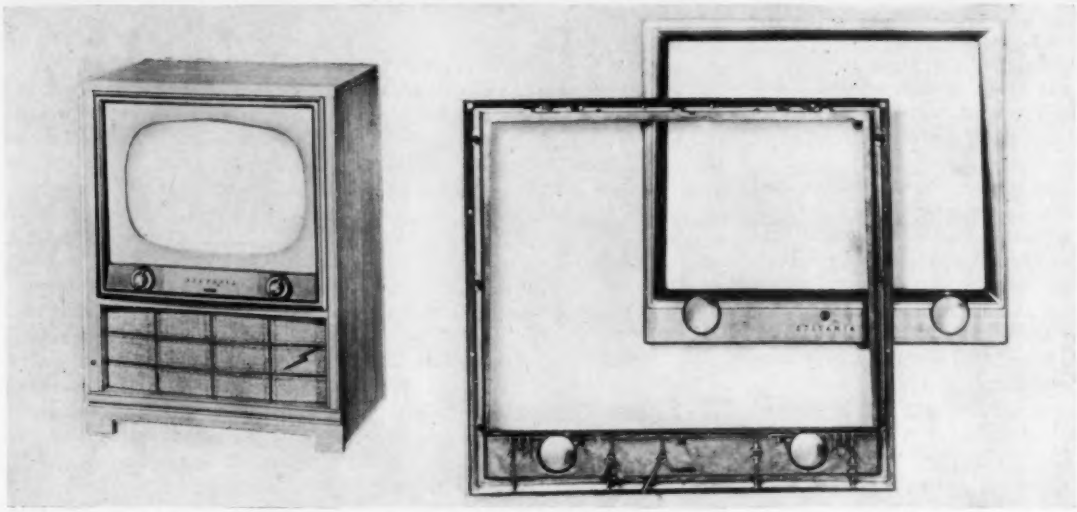
• Advertising, salesmanship, and supply of goods must be closely coordinated. Instances of failures in coordination between advertising and salesmen; between promises of ready supply and actual supply in stores; between promises of care-free use and efficient service could be cited by the dozens. They all lead to waste of money and effort. Marketing is a total operation.

• Territorial market measurements must be given close attention by sales management. Normal sales expectancy in each local area must be determined. This makes possible the efficient allocation of advertising, sales promotion, and sales manpower. Market analysis through such devices as consumer surveys helps produce the best possible result in sales for each dollar of sales expenditure.

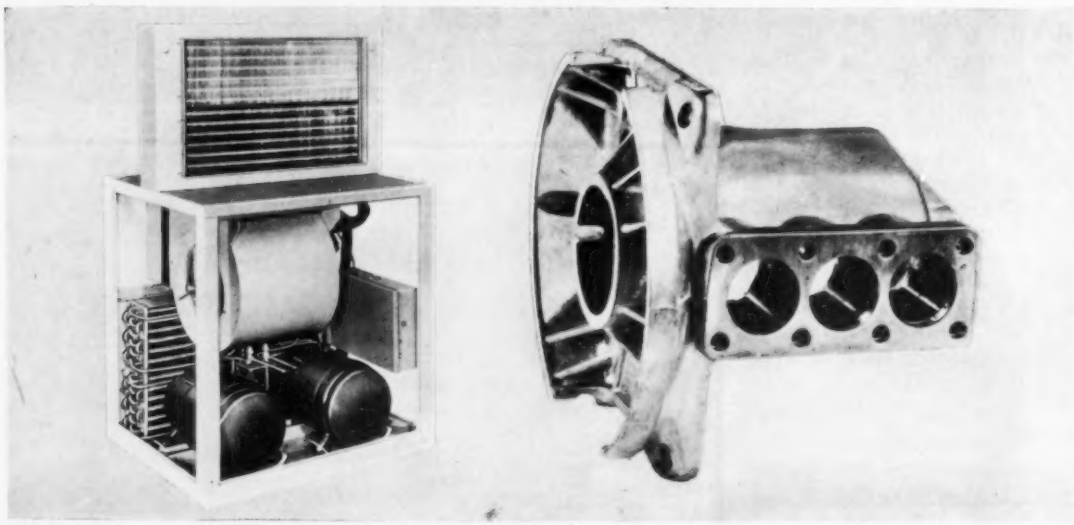
• Sales plans and budgets merely for the following year are not enough. Just as a business plans its financial structure years in advance, so the marketing structure must be planned years in advance. Salesmen training, for example, is no yearly package. It takes long-term effort.

• Creative thinking on the part of all members of management, especially sales management, is the real key to survival. Creativity cannot be allowed to fade and disappear, nor can it be allowed to "run wild." It, too, must be subject to planning and control.





REDESIGN of Sylvania television-receiver bezel from stamping to zinc die casting with integral fastening lugs eliminated welding operations to attach fastening units. Die-cast part is more rigid, offers better surface for decoration.



REFRIGERATOR COMPRESSOR has steel cylinder sleeves die-cast as inserts. Cylinder blocks of York Corp.'s two sealed compressors are aluminum die castings, each with three steel sleeves. Large end of casting mounts motor.

How to Redesign for Die Casting

Digested from PRODUCT ENGINEERING, Jan, p156

When you redesign a part made by another process for die casting, first you must consider the properties of available alloys. Then consider surface finish, savings in machining costs as compared with die cost, and possible savings with thinner sections.

Where do you look for possible cost reductions? Many places: in fastening methods, sound use of inserts, reduction in section thickness, addition of fillets on inside corners and radii on outside corners, cored holes, undercuts, drafts, and tolerances.

• **Fastening Methods**—Integral fastening points may reduce assembly costs, as on the Sylvania television-set bezel. Rivets, studs, lips, or lugs may be die-cast and staked, headed, or spun in zinc or aluminum. Integral projections can be designed for speed nuts or

spring fasteners, tapped for screws, or threaded for nuts.

Heading, staking, or spinning are more commonly used with zinc, particularly for permanent connections. Spring locking devices with a central barbed hole are not easily removed from a circular stud; where removal is necessary, the stud should have a flat side to allow removal of stud with a half turn.

• **Inserts**—In changing from a stamped assembly, the number of parts can often be reduced by cast—or pressed-in inserts. As they are expensive, they should be used when they serve to combine two or more parts into an integral structure or when properties needed cannot be supplied by cast metal, as with the York compressor.

• **Thin Sections**—Making sections as thin and uniform as possible reduces metal cost, increases production rate. Faster chill raises unit strength and lessens the tendency to porosity. Transition between sections of different thickness should be gradual.

• **Fillets, Corners, Draft**—Fillets should be at least 0.060 inch for strength and surface smoothness. A small outside radius reduces die cost and makes buffing easier. Draft allowances, which depend on metal shrinkage, should be great enough to prevent the metal from tearing during cooling.

• **Cored Holes**—In redesigning a sand casting, cored holes for self-tapping screws in the die casting may eliminate drilling and tapping operations. Coring can also save metal when holes or recesses can be added without extra die cost.

• **Undercuts**—In switching from a sand casting, eliminating undercuts can cut die costs. Undercuts on exterior surfaces, however, may save enough metal to more than offset the added die cost.

• **Tolerances**—In redesign, blanket tolerances can add needless cost. Close tolerances result in excessive expense in a die casting. While standard tolerances can often be bettered in normal practice, costs may be further reduced by adopting still wider tolerances on unimportant dimensions.

▶ YOU AND YOUR PERSONAL AFFAIRS

If you smoke a pack or more of cigarettes a day, you are running a 40% greater risk of dying of coronary heart disease than non-smokers. That's the grim warning to male smokers of a group of University of California scientists.

A definite link exists between the presence of large fatty particles in the blood and death from heart disease. The research program showed that smoking at least one pack a day resulted in a considerable increase in blood fat levels for men of 20 to 29 years old and a smaller increase for those 30 to 59.

Oddly enough, the researchers found no evidence that smoking contributed to the susceptibility of women to heart disease. And only cigarettes, not cigars or pipes, have this effect on men.

✦ ✦ ✦

So you have to buy a present for your wife, say at the end of a business trip, or for your secretary or for some other lady. What to give? One thing is always safe—perfume, if you buy the *right* perfume.

If you know the scent to buy, your troubles are over. You just have to spend the money. But if you do not know the right fragrance, here are some hints on how to pick it.

The first rule: keep in mind the personality of the wearer. Is she conservative? Or gay? Quiet and thoughtful? Does she love parties and night life? Match the scent to the personality.

Match the scent also to the place and time the wearer will use it. If it's office or afternoon bridge, buy a light, subtle fragrance. Light perfumes include flower fragrance—rose, lilac, or floral bouquet. Or try one with a bit of spice or a little sandalwood. And for the outdoor girl—spicy fragrances.

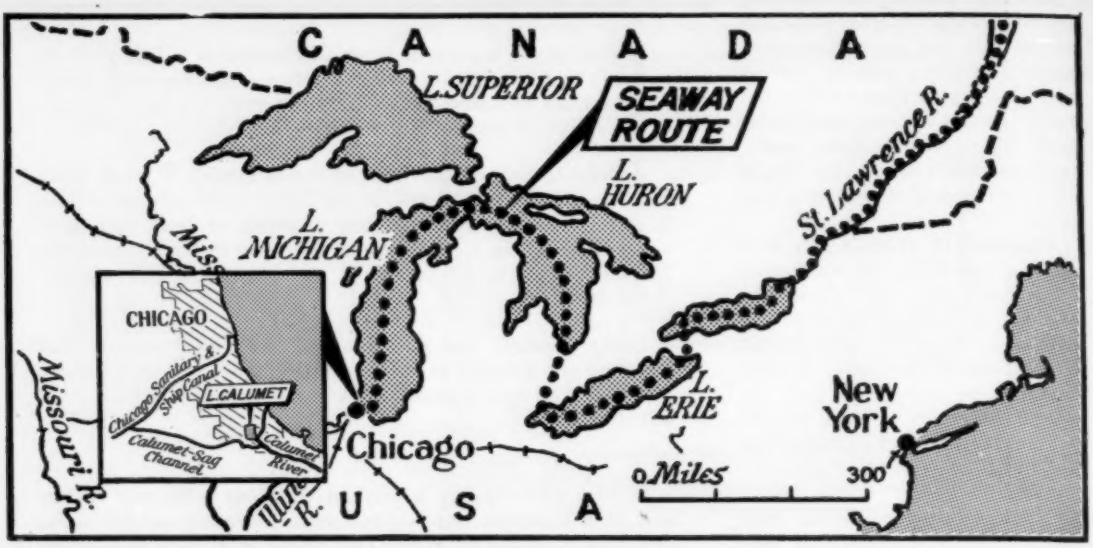
For an evening perfume, buy one of the heavier scents. The oriental perfumes have a clinging quality that makes them suitable for the gala dinner or theater party. One last suggestion: ask advice from the salesgirl, even though you might not want to buy the most expensive perfume.

✦ ✦ ✦

The executive who wants to renew his knowledge of investments or dig deeply into the subject can do so in "Introduction to Investments" (McGraw-Hill Book Co.). This book, while intended primarily for college-level classes in investment, can point the way to sounder personal investments.

First the book tells why an individual or a family needs a planned investment program and how to build it. Then it describes available investments, markets, and value factors. Finally it shows how personal investment policies are established and carried out, how the personal portfolio should be administered.

YOU has been compiled from American Business, Business Week, Factory Management & Maintenance, and other sources.



You Will Be Able to Reach U.S. Markets Easier . . .

When Chicago Becomes a Seaport

Digested from THE ECONOMIST (London) Dec 24, p1108

Businessmen in Western Europe who export to the U. S. may soon be shipping a big part of their merchandise via Chicago instead of New York. When they do, they will see their Chicago shipments get to U. S. Western and Midwestern markets quicker and cheaper.

Of course, the reverse applies, too. U. S. sellers located in the industrial Midwest will get their wares into the hands of European consumers quicker and cheaper. The St. Lawrence Seaway—finally beyond the stage of dreaming and bickering—is the coming improvement that will change the face of the map for North Atlantic shippers.

Chicago is hoping to become one of the great ports of the world. The "Windy City" is the principal transfer point between the St. Lawrence Seaway and the Mississippi water route to the Gulf of Mexico. City leaders have a vision of a harbor that will handle the vast agricultural and industrial trade of the Midwest. They see 15,000 acres of additional lands in the harbor area being developed.

This bright future for Chicago depends not only on the St. Lawrence project, to be completed by about 1960, but also on Chicago's Lake Calumet project, and on its Cal-Sag channel project (see picture).

The sheltered harbor of Lake Calumet, 20 miles south of the city's business center, was chosen for "seaport" development. It is connected to Lake Michigan by a 6-mile stream. Improvements will cost $24-million; they include dredging to accommodate ocean-going ships up to 10,000 tons, and the building of new docks, grain elevators, and transit sheds. Calumet will be served by over 20 trunk-line railroads and by two major highways for trucks.

To achieve the cheapest connection with Midwest markets—which account for around 40% of U. S. foreign trade—it will be necessary to use barges on the Cal-Sag channel, which leads from Lake Calumet harbor to the Mississippi waterway. The channel will be widened to 225 feet. When it is completed, large tow barges will transport fuels, grain, heavy chemicals, ores and finished products at cheap rates. European goods will be transferred from steamship to barge in Lake Calumet harbor—or from ship to train or truck.

An important volume of foreign trade is already being handled at Chicago. About 300 European ships, of 2,000 tons or less, docked at Chicago in 1955.

This total is expected to increase greatly, of course, when the waterway projects are completed. European and American shippers will then take advantage of the economy offered by the shorter all-water route between Chicago and north European ports.

Liverpool, England, for example, will be 168 miles closer to Chicago by the new route than by the present route through New York City. Shippers will save up to 25% in freight costs. The cost of shipping, say, jams from Britain to Chicago will be 10% less. On Scotch whiskey the saving will be 24%.

In reverse, the cost of shipping an automobile from Chicago to Rotterdam will be reduced 17%. The cost of shipping a tractor from Chicago to Sweden will be 25% less.

Helicopter Works As Uranium Hunter

Digested from AVIATION WEEK, Jan 9, p74

The many-faceted helicopter has shown that it also can serve as a versatile uranium hunter. The rotary-wing aircraft proved its worth during a recently-completed 8-month field trial conducted by the Bell Exploration & Development Corp. The test also showed, however, that geological and geophysical instrumentation must be improved if the aircraft is to reach its full development in this new field.

Bell Exploration & Development Corp., a market research organization operating under Bell Aircraft Corp.'s Helicopter Division, carried out its test using both the 200-horsepower Bell 47G and Model 47G-2 with a 260-horsepower engine derated to 200 horsepower. The tests were hampered somewhat because there are few uranium-hunting instruments available that were specifically designed for helicopter operation.

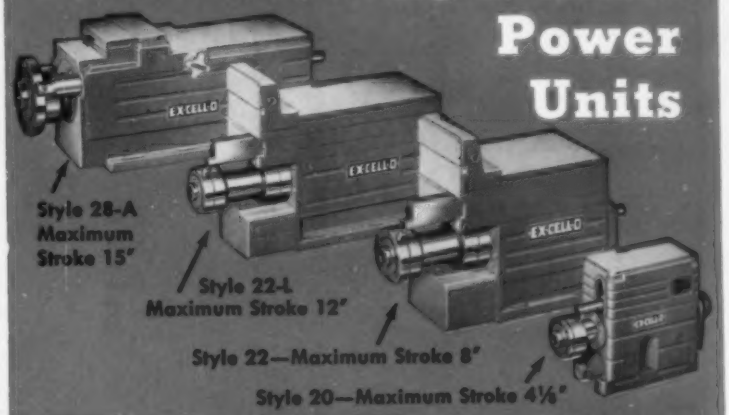
By flying a pre-planned traverse with the equipment recording, the geologist can visually inspect terrain for significant signs that indicate mineral deposits. This technique permits a geologist to cover at least 125 miles of traverse a day with a high degree of accuracy and completeness. A similar survey from the ground would require weeks.

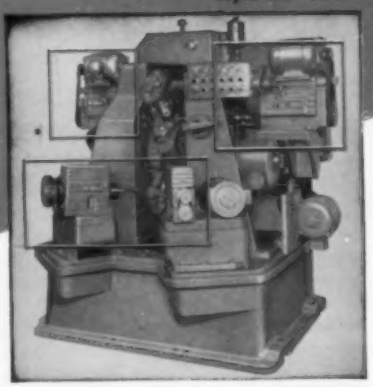
The helicopter's speed also pays off in allowing better utilization of the limited number of experienced geologists.

Survey flight speeds vary from 35 to 60 miles per hour. The lower speed is preferred by geologists when flying rim canyon outcroppings. Flying by survey grid, close to the ground and following contour eliminates the need for a radio altimeter and data reduction instruments, according to Bell personnel.

Promising anomalies shown by the airborne detection equipment can be checked on the spot by landing in the area. The location can then be staked out and claims filed within a few hours.

For High-Production Machines use.... Ex-Cell-O Quill-Type Hydraulic Power Units





This special machine with automatic indexing fixture core-drills piston pin holes and drills angular oil holes. It uses six Ex-Cell-O Power Units (shown without belt guards) operated from a central push-button station.

Ex-Cell-O Power Units feed and rotate tools in easily controlled automatic cycles. A single tool can be held in the unit spindle or a multiple head can be bolted to the quill flange. The Units are used in low-cost, high-production machines for such operations as drilling, reaming, counterboring and spot-facing. A typical machine consists essentially of a plain base, a work-holding fixture and one or more power units.

Ex-Cell-O Units are self-contained and compact; can be mounted horizontally, vertically with the spindle nose down, or at any angle between these positions. For details about these units write, or cable Ex-Cell-O in Detroit.

EX-CELL-O CORPORATION
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PRECISION MACHINE TOOLS • CUTTING TOOLS • MACHINES TO PACKAGE MILK IN SANITARY PAPER CONTAINERS.

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55-25

Summary of 1956 Latin-American Construction Projects

(Millions of Dollars)

Country	Power	Trans-portation	Buildings	Mining	Waterworks	TOTAL
Cuba	44.0	306.5		70.0	59.7	480.2
Dominican Republic		88.0	39.8			127.8
Puerto Rico	88.5	66.3	171.7	49.0	55.0	430.5
Mexico	34.6	117.9	30.6	182.0	77.8	442.9
Guatemala		45.5	1.0			46.5
El Salvador	15.0	36.9	88.9		20.0	160.8
Honduras		4.2				4.2
Nicaragua		8.2				8.2
Panama		26.7				26.7
Argentina	120.8	411.2	1036.4		211.5	1779.9
Bolivia	11.3	286.2	28.1	18.0	45.6	389.2
Brazil	410.5	1162.6	209.6	16.8	87.8	1887.3
Chile	30.9	333.3	382.8	53.9	98.7	899.6
Colombia	329.8	453.4	364.3	33.2	106.0	1286.7
Ecuador	10.2	34.7	4.0		12.0	60.9
Peru	27.0	131.1	89.5	230.0	50.5	528.1
Uruguay	185.3	77.9	80.8		55.5	399.5
Venezuela	102.5	310.0	197.7		127.0	737.2
TOTAL LATIN AMERICA	1410.4	3900.6	2725.2	652.9	1007.1	9696.2

Projects which are scheduled for completion prior to October 1956 are not included. Only projects in excess of $1-million are included.

Latin America: Billions for Building

Digested from INGENIERA INTERNACIONAL CONSTRUCCION, Mar, p42

The chart above shows the results of a survey of major Latin American construction projects. Conducted by Ingeniera Internacional Construccion, the survey reports a big jump in construction outlays for the sixth consecutive year. This year's total reached an all-time high of $9.696-billion—up 21% over 1955's peak of $8-billion.

Biggest slice of Latin American construction money goes to transportation. A great upsurge in highway planning and construction is going on in Central America. Within the next three years more money will be spent on road development there than in all preceding years combined. Much of this money will be spent on the Pan American Highway. To complete the stretch of highway between the Guatemala-Mexico frontier to the Panama Canal alone will cost about $109-million.

Nicaragua is carrying out a secondary and farm-to-market road program financed by World Bank loans. Honduras is launching a highway reorganization plan and Panama, with a new highway department, has road building and rehabilitation plans underway. Mexico will concentrate on completing three major highways that will integrate the country's network as well as link the U. S. to Central American highways.

Elsewhere in Latin America, emphasis is on both highway and railroad development programs. In Bolivia, more money—$166-million vs. $110-million—will be spent for railroads than for highways.

Continued growth of cities in all countries has sponsored new types of transportation facilities. New expressways and avenues and even subways are required for the large volume of traffic resulting from industrial expansion and increasing population.

Building activity is booming in practically every region to keep up with the needs of Latin America's growing economy. Industrial and government buildings require $200-million more than they did in 1955. More floor space is constantly needed for new industries and for expansion of old ones. Profits are being channelled into new industries with an eye towards growth and diversification.

Housing is becoming an increasingly important item in many public-works projects. There is a great need for low-cost housing and this is being provided by government financing. In Puerto Rico, low-cost houses are being mass produced on a huge scale.

One fact is obvious: Latin America can be a profitable market for anyone who wants to sell construction equipment and materials.

Precision built easy to handle

HITACHI CONVERTIBLE SHOVEL

does big jobs fast!

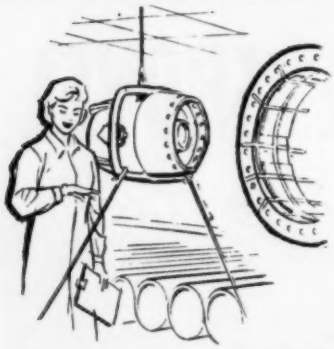
This convertible shovel is characterized by the use of shovel fronts of different types depending upon the purposes wherefor it is to be operated. The front may be changed to any of the following varieties to be most suitable for the given job: Shovel, dragline, clamshell, crawler type crane with a coal bucket, crawler type crane with a hook, drag shovel. A shovel will be supplied with the machine as the standard front equipment.

Hitachi, Ltd.

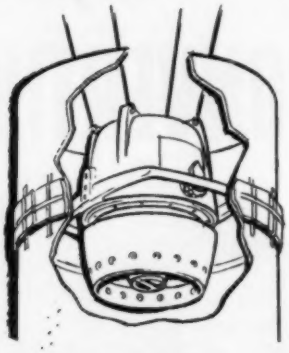
Tokyo Japan

Cable Address: "HITACHY" Tokyo

How You Can Use Atomic Cameras



FLANGE WELD. Operator is making a spot radiograph of weld that joins flange section to pressure vessel's shell. Gamma rays expose image of weld on film taped behind welded joint.



PANORAMA is 360 degrees. Entire circumferential weld is radiographed in a single exposure. Projector is suspended inside vessel with film taped around entire outside circumference.

CIRCUMFERENTIAL WELD SHOT. Here projector is positioned close to pipe. Only weld on far side is radiographed. By moving camera back weld appears as ellipse on film.

Atomic Camera Sees Through Metal

You can mount this camera on lift truck or dolly, or carry it by hand to project gamma rays through metal to spot flaws. You can support it in fixtures or hoists to find imperfect welds, flaws or cracks even smaller than 2% of material's thickness. Camera makes radiographs in places much too small to admit an X-ray tube. Yet gamma rays are powerful enough to make clear images through various metal thicknesses and shapes.

You don't need external power. When shutter is open a radioactive isotope inside the projector sends out beam of gamma rays that produce shadow images on photographic film.

Gamma-ray projectors come in three sizes. For easiest handling, choose the smallest-size projector. It is portable and weighs 75 pounds. This model is useful for checking repair of pipeline welds at widely scattered jobs. It is quickly set up for shots in difficult places, as for welds where pipes are close together. The medium-size gamma ray projector can be adjusted to emit radiation in doughnut, hemispheric, or cone patterns. The largest-size projector is for heavy-walled pressure vessels, pipe and heavy-fabricated fillet and butt-welded assemblies.

When used for pressure vessels, tanks, and large diameter piping, the camera is placed inside the work and makes either spot shots or 360-degree panoramas.

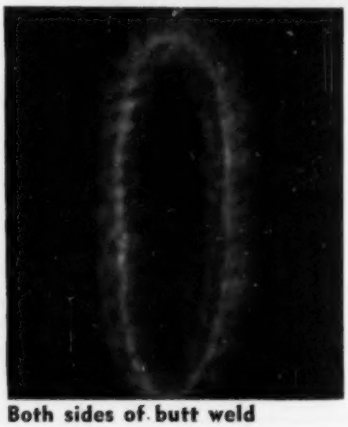
Three energy sources of different strengths are also available: radioactive isotopes of cobalt 60, cesium 137 and iridium 192. Industrial life of these isotopes is 15 years, 80 years, and 7 months, respectively.

Intensity of energy source is balanced against service needs. That is why cameras are efficient for their purposes while reasonable in size, weight, and cost.

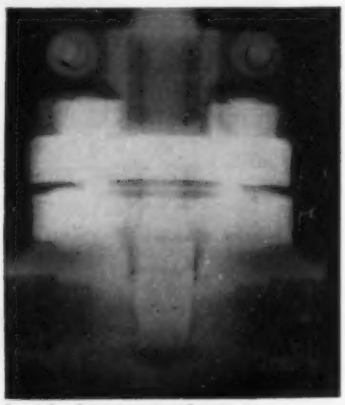
Exposures are short. Time depends on five factors: film speed, source, source strength, distance and thickness of material being radiographed. Slide rule helps to calculate each job's exposure quickly.

Compared with X-ray equipment that does a comparable job, these cameras need no power source, are light, and require no maintenance during life of radioisotope. They are better on thick sections of metal, while X-ray is better on thin sections. **(Metal & Thermit Corp., 100 E. 42nd St., New York 17, N. Y.)**

What the Camera Can Show You



Both sides of butt weld

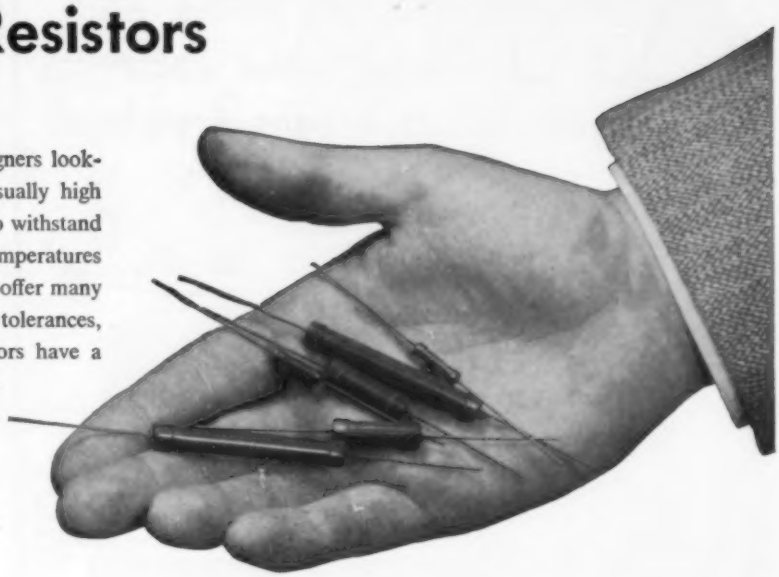


Inside heavy sections

What you should know about

Corning High-Temperature Film-Type Resistors

Manufacturers and electronic designers looking for a resistor which has unusually high electrical stability and the ability to withstand high ambient and high operating temperatures will find Corning Type S Resistors offer many advantages. Mass produced to close tolerances, Type S High Temperature Resistors have a normal resistance tolerance of 2%.



Corning Type S Resistors give you:

Excellent high temperature characteristics—These resistors will operate at ambient temperatures up to 200°C.—have an unusually low temperature coefficient of resistance.

Remarkable stability—The resistive element of Corning Type S Resistors is so stable it can be cycled from near absolute zero to red heat without impairing its electrical properties.

Superior high frequency characteristics—The thin film insures inherent stability and provides excellent high frequency characteristics.

Specifications—Corning Type S Resistors

Power Rating	SIZE Length	SIZE Diameter	RESISTANCE Min. (ohms)	RESISTANCE Max. (ohms)
1 Watt	19/32"	11/64"	10	10,000
2	15/16"	19/64"	10	40,000
4	2 1/16"	19/64"	20	100,000

Rugged construction—The new film material makes integral contact with the heat-resistant base to form a tough bond. Fired-in silver bands afford low resistance, low noise termination.

Space saving—Since they operate at higher power levels, Corning Type S Resistors afford important space savings.

MAIL THE COUPON BELOW FOR ADDITIONAL INFORMATION ON CORNING RESISTORS FOR A WIDE RANGE OF APPLICATIONS

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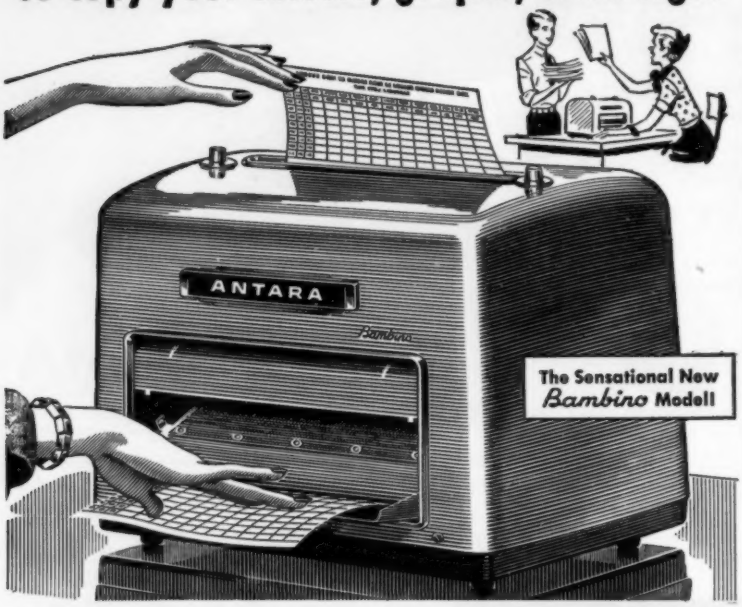

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Also for industrial use: the large desk-top model, the ANTARA **O-M** . . . copies up to 16" wide (40 cm.) . . . or the upright model, the ANTARA **Streamliner** . . . copies up to 42" wide (106 cm.).

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Electronic Sorter

The Remington Rand Electronic Sorter sorts 48,000 alphabetic, numeric, blank and special code punched-cards per hour. Push-button simplicity of the sorter assures instant selection of the column to be sensed; and variable sequence sorting 0 to 9, A to M, and N to Z cards in any order.

A complete alphabetic or alphanumeric sort is provided through 13 receivers for cards selected automatically, plus a 14th receiver for non-selected cards. Double capacity feeding magazines and card receivers permit efficient extra output for the unit. **(Remington Rand, International Div., 315 Fourth Ave., New York 10, N. Y.)**

•

Steel Reinforces Tires

New tubeless tires made with steel are practically puncture-proof and need little servicing.

Steel wire is used in filaments, twisted into strands and laid in criss-cross layers. A hoop of two layers of the wire is embedded in rubber at the base of the tread, forming a shield that protects the carcass and makes a permanent bond between tread and carcass.

In the event that something does penetrate the steel wire, the tire can be repaired in the same way as ordinary tubeless tires. **(U. S. Rubber International Co., 161 E. 42nd St., New York 17, N. Y.)**

•

Wheel Finishes Contours

Reduction in polishing costs can be achieved with a new type of wearable coated abrasive contour wheel. Significant advances offered by the "Kon-Tor" wheel include: development of fine finish on involved contours; maintenance of original contour through the working life of the wheel; elimination of one or more buffing stations.

Designed for use on straight-line and rotary automatic polishing equipment, it is equally adaptable to semi-automatic fixtures where it requires no special attachments or accessory equipment. **(Norton Behr-Manning Overseas, Inc., Worcester 6, Mass.)**

Tired of shoveling?

We have news for you! Chesapeake and Ohio is building a new bulk cargo pier at Newport News, Virginia that will unload iron, chrome, manganese ores, or similar materials at the rate of 60 tons a minute. That's right! In less than 2 hours it would be licking up the last crumbs of a 7,000 ton cargo. Think what that can do to turn-around time!

Whatever you want to get into or out of the U. S. A., you'll usually find you can do it faster and better and cheaper at Newport News.

WRITE FOR FREE, ILLUSTRATED BOOKLET which tells the facilities and advantages of this friendly port.

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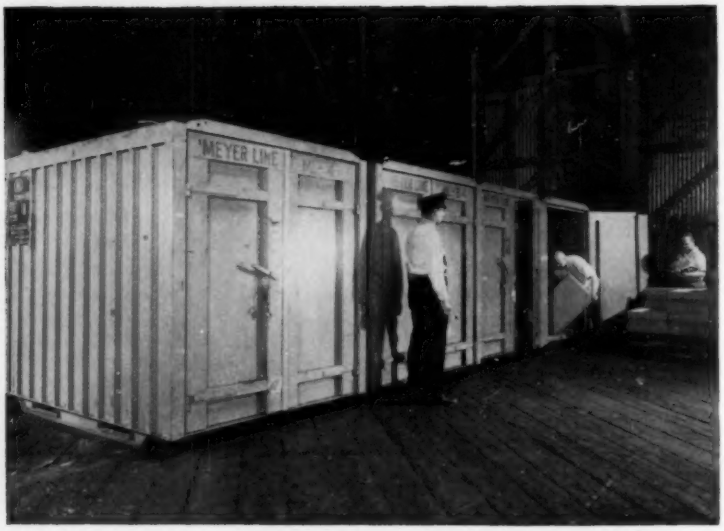
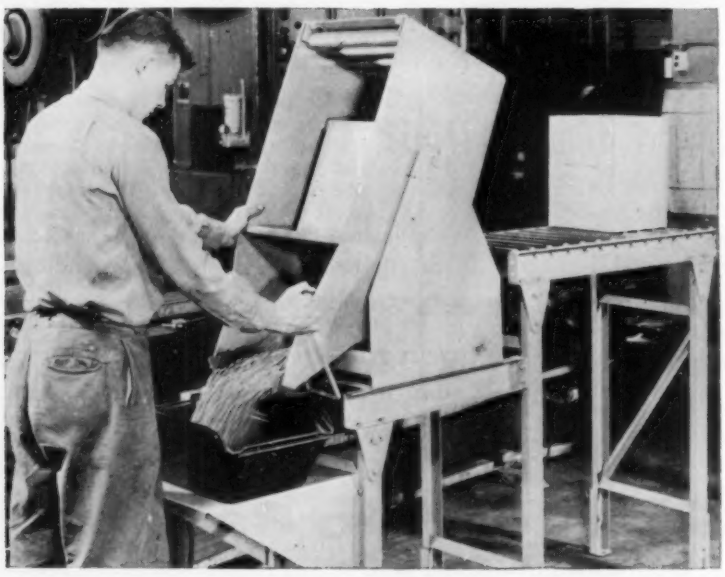


Containers Prevent Damage and Pilferage

Prevention of pilferage and damage in overseas shipments of valuable and fragile cargoes through the use of large steel shipping containers has proved successful. The welded steel containers are equipped with double doors. Phonograph records, photographic supplies, hardware, pharmaceuticals, electrical appliances are stored in the containers upon receipt at the pier. When the containers are filled, they are swung aboard ship by cranes. By consolidating small packages into one unit, material handling on the pier is made easier. The containers may be tiered in the hold to gain additional storage space. (Dravo Corp., Neville Island, Pittsburgh 25, Pa.)



Eases Handling of Small Parts

The NesTier Rollover Loader provides a simple way of transferring small parts from shipping boxes and kegs to in-plant containers. Here are some of the bonus benefits you will get: no more costly manual operations, no damage and loss to parts, no complicated inventories. Controlled flow feature allows accurate measurement of parts into your in-plant containers. (Charles Wm. Doepke Mfg. Co., 1947 Emerald Ave., Rossmoyne, Ohio.)

Heavy-Duty Electric Plant

Model 2LK electric plant was built for rugged heavy-duty service on jobs requiring economical, long-life performance. The compact unit, weighing 235 pounds, produces 2,000-watt, 60-cycle alternating current at 18 revolutions per minute or 1,500 watts at 50 cycles.

The unit is powered by a single-cylinder, air-cooled, four-cycle gasoline engine with hard-faced rotating exhaust valve, large long-wearing bearings, and efficient air-cooling. **(D. W. Onan & Sons, Inc., Minneapolis, Minn.)**

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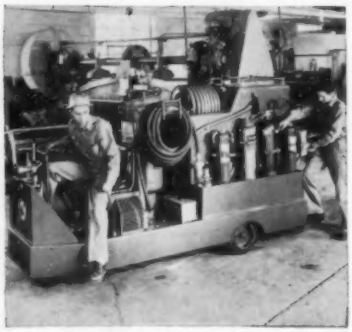

For In-Plant Fires

New line of easily maneuverable in-plant fire trucks is designed to carry a wide assortment of fire-fighting equipment. They are especially adaptable to the needs of plant fire brigades.

Trucks are available in six basic models. The KB 8, featuring a 300-pound Ansul dry-chemical unit backed up by a 150-gallon water-fog system, is expected to find the widest application in industry.

Accessories include ladders, utility bar, light, hose, portable fire extinguishers. All are mounted with panic-proof, quick-release brackets to make their removal simple and fast. **(Ansul Chemical Co., Marinette, Wis.)**

●

Degasser for Better Castings

Degassification performed by new mobile degasser results in cleaner foundry castings and eliminates the need for gas or chemical flushing. It improves physical characteristics of the metal, allows use

of lower-grade secondary metals, and makes impregnation unnecessary.

The wheel-mounted unit is 6 feet square and 5 feet high. It consists of a mechanical vacuum pump and gear motor, filter, and degassing chamber. **(Kinney Mfg. Div., The New York Air Brake Co., 3640 Washington St., Boston, Mass.)**

●

Fabric "With a Memory"

Polythylene yarn is a monofilament yarn which can be prestretched before being woven in a fabric, but will "remember" its original length and return to it when immersed in boiling water.

The fabric, called Trilok, is woven on a regular loom, out of polyethylene and conventional yarns. The moldability of the fabric would save in tailoring costs, give shape and eliminate wrinkles in the case of theater seats, floor coverings, upholstery. **(U. S. Rubber Intl. Corp., 161 E. 42nd St., New York, N. Y.)**

●

New Lift Trucks

The new heavy-duty RC-SC lift truck series is available in capacities of 15,000, 16,000 and 18,000 pounds all at 24-inch load centers. The trucks are equipped with either gasoline or Perkins P6 diesel engines.

The RC-SC series offers two-wheel center-point steering which creates easy maneuverability. The trucks are mounted on 8.25x20 pneumatic tires and powered by water-cooled engines. Standard height of lift is 17 feet 6 inches with optional heights available up to 24 feet. **(Hyster Co., 1800 North Adams St., Peoria 1, Ill.)**

Light Weight Generator

The Homelite 35A115 is a 115-volt, 60-cycle alternating-current generator, developed for use by utilities, contractors, builders, construction men and municipal departments. It will operate all types of portable electric tools and provide standby power in emergencies.

The generator weighs only 90 pounds, yet delivers 1500 watts of dependable power. It can be set up in any location . . . no need for long, power-robbing cables. Equipped with four outlets, the unit can operate several tools simultaneously. **(Homelite, Port Chester, N. Y.)**

●

Resistance Welding Control

A new line of resistance welding controls features printed circuits and a weld-safe circuit for the protection of equipment and work in process. Circuit simplification combines with the use of printed circuits to reduce panel weight by 30%.

Heavy duty, long life components are used for maximum operating life. Capacitors, for example, are rated at 600 volts even though circuit voltages are normally 115 volts.

All component locations and ratings are printed on the front of the panel to facilitate inspection and servicing. **(Westinghouse Electric Corp., 40 Wall St., New York 5, N. Y.)**

Filter Elements Handle Viscous Fluids

Poro-Klean filter elements can handle very viscous fluids at differential pressures in excess of 2,000 pounds per square inch. They resist most corrosive action and temperatures above 1000°F. Poro-Klean elements fit the Micro-Klean line of housings now widely used with throwaway filter cartridges. These porous metallic elements can be cleaned for reuse over an indefinite number of filtration cycles. Being metal, they can be sterilized. And because there are no fibrous components, they assure a filtrate entirely free of any fibrous contaminants. (Cuno Engrg. Corp., Meriden, Conn.)

WEED KILLERS

More crops are being harvested, more pasture land reclaimed because of chemical weed and brush killers. Many of these modern agricultural chemicals are supplied by Dow.

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Elevator-Conveyor

The Magna-Mover, permanent magnetic elevator-conveyor for automated handling of items such as bottle-caps, cans, nails, bolts, blanks, finished parts and scrap, was designed to operate with easy efficiency even under space limitations.

The automation values of the Magna-Mover are many: production costs are lowered by reduction of manual handling; production is increased by cutting down loading and unloading and handling delays; quality is increased because parts are not damaged by piling up and hitting each other. It shortens lengths of conveyor lines, provides safer operation by eliminating hazardous handling of sharp or jagged objects, reduces manpower fatigue.

Maintenance is reduced to a minimum in the new unit, which is equipped with permanently lubricated bearings throughout. The belt take-up is readily accessible, permitting quick and simple adjustment of the conveyor belt as required. **(Eriez International Corp., Erie 6, Pa.)**

●

Light Like Sunlight

The Fluomeric lamp combines yellow-red tone of incandescents and blue-green hue of mercury-vapors, with the flexibility of fluorescent phosphors to produce a natural sunlike glow. Yet it is bright enough for high-bay installations, or anywhere in the plant where good lighting is needed.

The lamp produces 25 lumens per watt compared to 18 for incandescents. **(Duro-Test Corp., 2321 Hudson Blvd., North Bergen, N. J.)**

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Reduces Cost of Surveying

Costs of producing surveys and maps for a wide variety of industrial and engineering uses will be greatly reduced through use of a new aerial mapping instrument, the Balplex Plotter.

The new instrument will produce maps from aerial photographs with contour intervals as small as 1 to 2 feet. When placed in the plotter, reduced transparencies made from the photographs produce a 3-dimensional view of the ground such as might be seen by a giant whose eyes were hundreds of feet apart. **(Bausch & Lomb Optical Co., 635 St. Paul St., Rochester, N. Y.)**

●

Faster Street Cleaning

Jeep, equipped with a 6-inch suction hose, cleans gutters six times as fast as a man with broom and pushcart. Dual controls are provided so the driver can slide to the right side and keep an eye on the cleaning.

Power for the suction comes from a 4-cylinder auxiliary engine, which also runs a machine to pulverize debris. Clean sweeping is aided by a heavy wire brush next to the hose snout, which dangles from the right side of the vehicle. **(Willys-Overland Export Corp., Toledo, Ohio.)**

●

Switch Provides Press Safety

Micro Switch trip control and an electric two-hand clutch control for industrial machines increase both production and operator safety. The increase is made possible by simple, direct operating motions of the operator; feather-touch, finger-tip operation of the control switches, and other features which reduce operator fatigue and speed up the machine's operations.

A safety feature requires both hands of the operator on the trip-control switches. Any number of hand or foot switches may be wired into the control circuit, any number of which may be locked out. **(Minneapolis-Honeywell Regulator Co., 2747 Fourth Ave. S., Minneapolis, Minn.)**

●

Powder-Cuts Concrete

When used with with Linde Air Products Co.'s new powder nozzle, a standard powder-cutting blowpipe will cut thick sections of reinforced concrete. Tested on a demolition job, it cut 2,928 square feet of concrete wall ranging from 10 to 18 inches thick into easy-to-handle squares. A metallic powder is added to the oxyacetylene flame to increase temperature for quick cuts. **(Union Carbide International Co., New York 17, N. Y.)**
N. J.)

NEW PRODUCT BRIEFS

Heavy-duty Projector — Model 14-5 contour projector combines maximum table travel and a 14-inch screen. Large heavy parts may be handled easily on the new projector. **(Eastman Kodak Co., Rochester 4, N. Y.)**

●

Saw Chain Sharpener—Model EG-180 electric saw chain sharpener puts keen edges on saw chains, wedges, chisels and other blades. The tool also does a satisfactory job when used for touching up rust spots. **(Mall Tool Co., 7725 Chicago Ave., Chicago 19, Ill.)**

●

Air Conditioner—"Flexi-Cool," a completely new air-conditioning unit, can be installed remotely with duct work extended to conditioning area. The cooling section alone may be added to an existing furnace. Where water is scarce, "Flexi-Cool" may be connected to an air-cooled condenser. **(Worthington Corp., Harrison, N. J.)**

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FACE LIFTING Contractor's Hill IN PANAMA

Huge rocks are blasted from benches for hauling to the spoil area in 22-ton "Eucs" that are working 20 hours a day to meet the 15 month contract deadline.

Gaillard Cut is the narrowest section of the Canal—Contractor's Hill, at left in this photo, threatens to slide into the channel. It is being benched to shift center of gravity away from the Canal.

Tecon Corp. picked "Eucs" for this big rock job

When Tecon Corp. was awarded the contract for this 2 million yard face-lifting project, they knew they had an urgent and mighty important job ahead of them. If new fissures in Contractor's Hill caused a slide into the narrow channel at Gaillard Cut, the Panama Canal could be closed to shipping for many months.

To meet the 15 month contract deadline, 8500 yds. of solid rock must be moved every day to a spoil area a mile away. Because of their experience with Euclid equipment on other tough jobs, Tecon chose Rear-Dump "Eucs" of 22 ton capacity. A fleet of nine machines with 300 h.p. engines and Torqmatic Drives were rushed to the site and are working 20 hours a day.

On big jobs like this one, as well as on more routine construction and mining operations, the dependable performance of "Eucs" gets more work done at lower cost per ton or yard. Your nearby Euclid dealer will be glad to provide facts and figures on the complete line of Euclid earth moving equipment.

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Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

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YOUR MANAGEMENT READING

Management Digest's editorial staff here again does the "worthwhile reading" for you to save your time. For the following literature, please write directly to the addresses given.

Helpful Hints on Conveying—Bulletin 55-11 is a useful reference source for everyone who has anything to do with the development and engineering of chain conveyors. (Chain Belt Co., Milwaukee 1, Wis.)

Vacation Guide—If you want to know the monetary exchange in Jordan or the purity of water in Pakistan, the answers can be found in the "TWA Vacation Guide and World Atlas." It contains not only travel information but most everything of interest to the tourist. Price is $7.50. (C. S. Hammond & Co., 515 Valley, Maplewood, N. J.)

Product Development—"The Key to Burroughs' Growth" is a story of expansion. Booklet describes the growth of the parent company and the diversification of its product line. (Burroughs Corp., Detroit 32, Mich.)

Sectional-Type Shelters—Folder describes Yard-Stor prefabricated storage shelters, which can be quickly erected to provide storage facilities for military, construction, industrial and agricultural purposes. (Yard-Stor Shelter Co., 19256 John R, Detroit 3, Mich.)

Silicone Mold Lubricants—Bulletin 5-111 is a comprehensive study of silicone mold lubricants for the rubber industry. Properties and performance of release agents are discussed. (Dow Corning Corp., Midland, Mich.)

The Road to Payload Profits—Booklet analyzes the advantages of aluminum construction for truck trailers. Fleet owners can quickly and accurately determine the economic value of aluminum trucks and trailers. (Aluminum Co. of America, 771 Alcoa Bldg., Pittsburgh 19, Pa.)

Growth Stocks—The term "Growth Stocks" is one of the most popular expressions of American investors and one of the least understood and hardest to define. Booklet "111 Growth Stocks" tells you what they are . . . and how to choose them. (Merrill, Lynch, Pierce, Fenner & Beane, 70 Pine St., New York 5, N. Y.)

The Atom in Our Hands—Booklet describes some of the interesting work being done at the atomic-energy center at Oak Ridge, Tennessee. The reader is given a glimpse of atoms at work in medicine, industry, and agriculture. (Union Carbide Intl. Corp., 30 E. 42nd St., New York 7, N. Y.)

Incinerators—1956 American Incinerator catalog covers the design, manufacture, and erection of all types of incinerator units for municipal, industrial, commercial and residential use. (American Incinerator Corp., 5710 E. Nevada, Detroit 34, Mich.)

Better Management—Booklet entitled "Controls and Techniques for Better Management" discusses operations research in non-technical terms. It explains what management can expect from the new tools that assist it in the decision-making process. Price is $1.75. (American Management Assoc., 1515 Broadway, New York 36, N. Y.)

The Publisher Says . . .

This is Paul R. Miller, Jr.

Effective with this issue of MANAGEMENT DIGEST, Mr. Miller assumes the post of editor. He will have the responsibility of directing the staff that "does the worthwhile reading for you." He will have the job of interpreting management developments and information for you.

And Mr. Miller is well-qualified for this job. He is a graduate of Princeton University, with honors in the Woodrow Wilson School of Public and International Affairs. He has been with McGraw-Hill since 1949, first as an editorial assistant on "Business Week" and later as that magazine's Assistant Foreign Editor. Most recently, he has been Business Abroad Editor of that leading American management magazine.

Mr. Miller's appointment is another indication to MANAGEMENT DIGEST readers that we are making every effort to produce a magazine that will have great value for you.

Sincerely yours,

Charles S. Mill

Charles S. Mill

Publications Digested

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American Machinist
Aviation Week
Business Education World
Business Week
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Chemical Engineering
Chemical Week
Coal Age
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Control Engineering
Electrical Construction & Maintenance
Electrical Merchandising
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Electrical World
Electronics
Engineering & Mining Journal
E&MJ Metal & Mineral Markets
Engineering News-Record
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Modern Packaging *Modern Plastics*

Dartnell Publications, Inc.
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F. W. Dodge Corp.
191 W. 40th St., New York 18, N. Y.
Architectural Record

The Economist Newspaper, Ltd.,
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The Economist (London)

Fritz Publications, Inc.
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The Paper Industry

Harvard University
Soldiers Field, Boston 63, Mass.
Harvard Business Review

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Ceramic Industry

Keeney Publishing Co.
6 N. Michigan Ave., Chicago 2, Ill.
Heating, Piping & Air Conditioning

Petroleum Publishing Co.
211 S. Cheyenne Ave., Tulsa 1, Okla.
The Oil and Gas Journal

Printers' Ink Publishing Co., Inc.
205 E. 42nd St., New York 17, N. Y.
Printers' Ink

Rubber and Technical Press Ltd.
147 Grosvenor Rd., Westminster, London, S.W. 1, England
The Rubber and Plastics Age

Simmons-Boardman Publishing Corp.
30 Church St., New York 17, N. Y.
American Builder, Marine Engineering, Railway Age, Railway Track and Structures, Railway Locomotive and Cars, Railway Signaling & Communications

Temple Press Ltd.
Bowling Green Lane, London E. C. 1
Plastics, The British Motor Ship

The Times Publishing Co. Ltd.
Printing House Square, London, E. C. 4
The Times Review of Industry

Welding Engineer Publications, Inc.
12 East Grand Ave., Chicago 11, Ill.
Welding Engineer

Index to Advertisers

AIR EXPRESS INTERNATIONAL CORP..... 24
ALLIS-CHALMERS MANUFACTURING CO. Tractor Division 1
ALLIS-CHALMERS MANUFACTURING CO., Industries Group 2
BETHLEHEM STEEL EXPORT CORP.....3rd Cover
BURROUGHS CORPORATION 4
CHESAPEAKE & OHIO RAILWAY..... 45
CORNING GLASS WORKS..... 43
DITTO INCORPORATED 23
DoAll COMPANY 6
DOW CHEMICAL INTL. LTD..... 48
EX-CELL-O CORPORATION 39
FORD MOTOR CO. LTD..... 27
HITACHI, LTD. 41
HYSTER COMPANY .....4th Cover
LINK-BELT COMPANY 25
GENERAL ANILINE & FILM CORP..... 44
GENERAL MOTORS OVERSEAS OPERATIONS.. 50
NORDBERG MANUFACTURING CO..... 30
REMINGTON RAND INC..... 31
UNDERWOOD CORP. 35
UNION CARBIDE INTL. COMPANY..... 29
VICTOR SAW WORKS INC..... 26
WALLACE & TIERNAN INC..... 28
YODER COMPANY.....2nd Cover

CONSULTING AND BUSINESS SERVICES 48, 49

This index is a service to readers. Every effort is made to maintain its accuracy, but MANAGEMENT DIGEST assumes no responsibility for errors or omissions.

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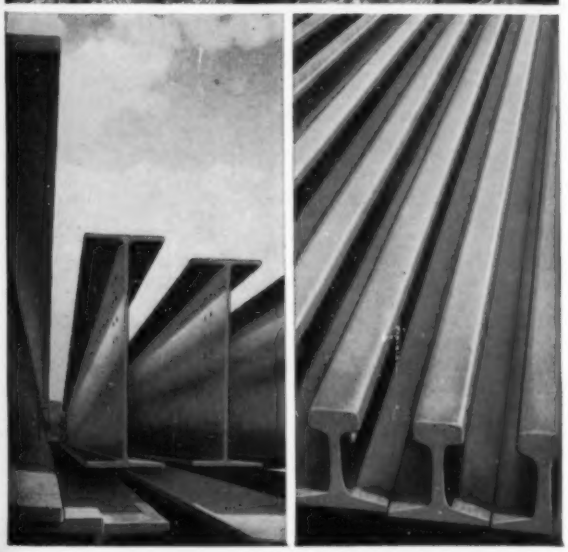

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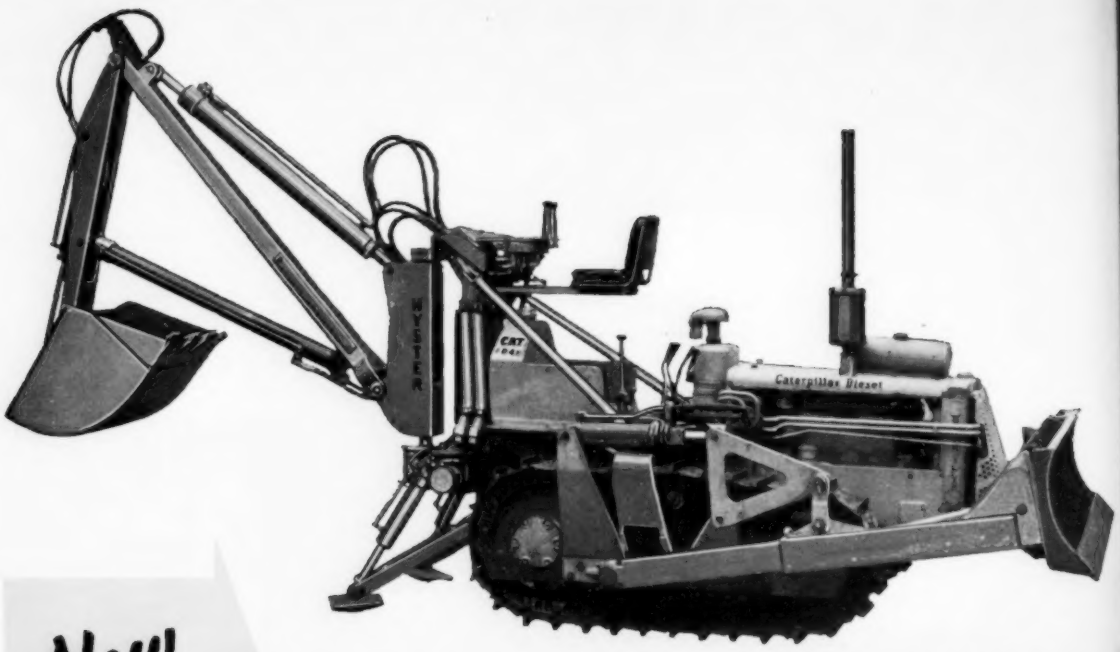


New HYDRAULIC D-4 BACKHOE

1/2 yard capacity

A MAJOR ADVANCE IN THE TRACTOR-MOUNTED BACKHOE FIELD

HYSTER — The Only Backhoe Designed *Specifically* for the Caterpillar D-4 Tractor

The new Hyster D-4 Backhoe digs anywhere a track-type tractor can go! Digs down to 13 feet, loads up to 9′ 7½″.

You get these outstanding operating benefits:

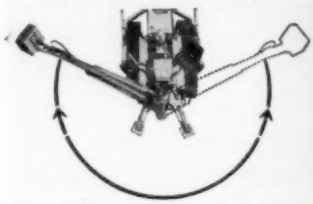
3 Dippers Available — giving 13″, 21″ and 29″ cutting width. Equipped with replaceable alloy steel points crimped onto adapters from bottom for easy replacement.

Retractable Hydraulic Outriggers provide full machine stability. Can be raised to allow 17″ clearance in travel.

Convenient Controls make possible easy, fast operation—with full visibility from high, comfortable operator seat.

. . . Plus many other advanced features, making the Hyster Hydraulic D-4 Backhoe one of the fastest, most profitable digging machines available, regardless of footing or terrain conditions.

FULL TRACK OSCILLATION. Equalizer arrangement provides true track-type tractor mobility to move about with ease over rough terrain. Equalizer can be locked to provide rigid machine while digging.



FULL SWING POWER is maintained through a 240 degree arc. Makes possible higher digging efficiency. Rack-and-gear type swing mechanism is fully protected and sealed in oil bath.

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